Triangles

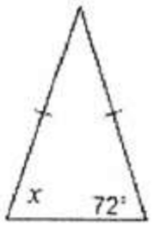
Hw Section 4.1

Draw the following. Mark the picture!!!

1. Obtuse Isosceles Triangle	2. Acute Equilateral Triangle	3. Right Scalene Triangle

Find *x*.

4.



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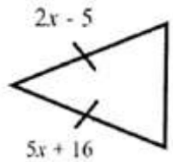

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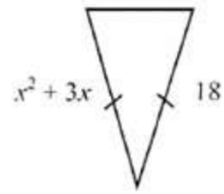

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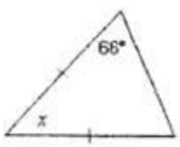

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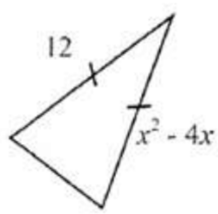

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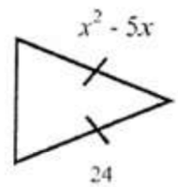
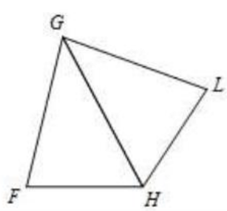
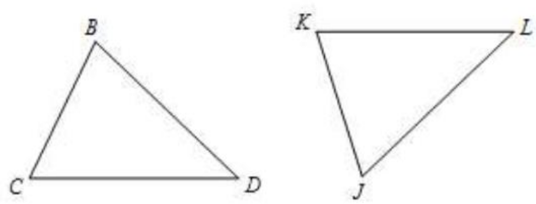


Mark the angles and sides of each pair of triangles to indicate that they are congruent.

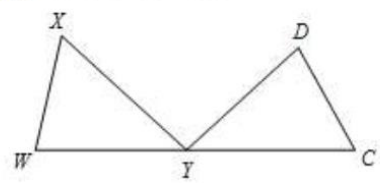
10. $\Delta GHF \cong \Delta GHL$



11. $\Delta CBD \cong \Delta JKL$

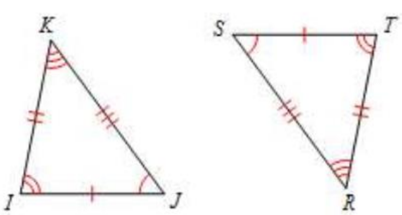


12. $\Delta WXY \cong \Delta DCY$



Write a statement indicating that the triangle pair is congruent. ORDER IS IMPORTANT!!!

13.



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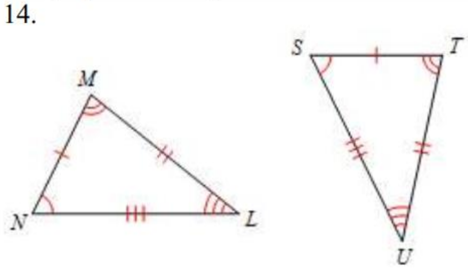

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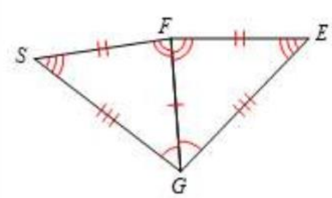
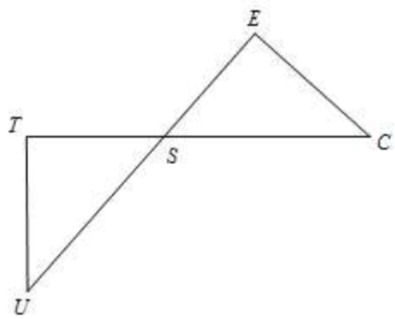
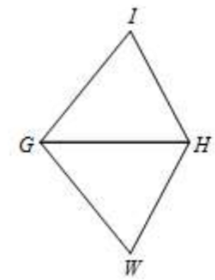
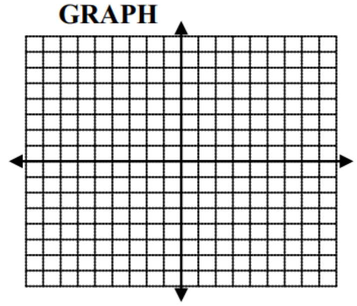
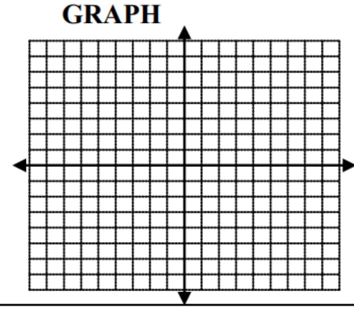


Complete each congruence statement.		
16. $\Delta SUT \cong \Delta SCE$  $\angle U \cong ?$	17. $\Delta VWX \cong \Delta VLM$ $\overline{WX} \cong ?$	18. $\Delta HGI \cong \Delta HGW$  $\overline{GI} \cong ?$

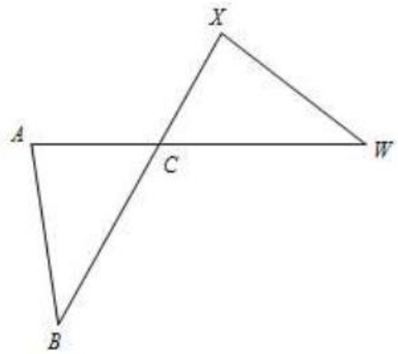
ALGEBRA REVIEW		
SOLVE $2(3x-4)-5=-7$	**GRAPH** $y=\frac{3}{4}x$ 	**MULTIPLY** $(2x-3)(x+3)$
SOLVE $\frac{x}{5}=\frac{x+2}{15}$	**GRAPH** $y=x$ 	**FACTOR** $x^2-4x-12$

Triangles

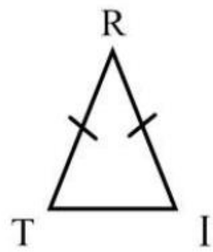
Application Section 4.1

1. Mark the picture.

$\Delta CBA \cong \Delta CWX$



2. Given $\angle T = x^2$ and $\angle I = 3x + 18$. Find x.



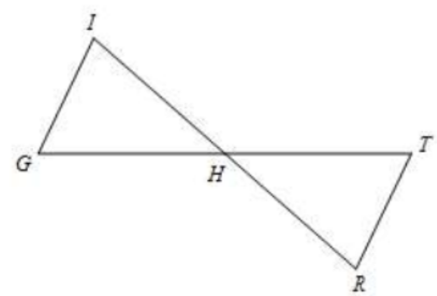
Watch the application walk through video if you need extra help getting started!

In order to prove that two triangles are congruent, you must show that every corresponding angle and every corresponding side is congruent.

3. Mark the picture and then prove it. Show ALL SIDES and ALL ANGLES ≅ !!!

Given: $\overline{GI} \parallel \overline{TR}$
H is the midpoint of $\overline{GT}$
$\overline{GI} \cong \overline{RT}$
$\overline{HR} \cong \overline{IH}$

Prove: $\Delta GHI \cong \Delta THR$

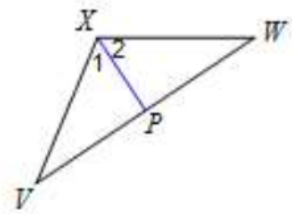


STATEMENTS	REASONS
1. $\overline{GI} \parallel \overline{TR}$ H is the midpoint of $\overline{GT}$ $\overline{GI} \cong \overline{RT}$ $\overline{HR} \cong \overline{IH}$	1.
2. $\overline{GH} \cong \overline{HT}$	2.
3. $\angle G \cong \angle T$	3. Alternate Interior Angles are congruent
4. $\angle I \cong \angle R$	4.
5.	5.
6. $\Delta GHI \cong \Delta THR$	6. Definition of Congruent Triangles

4. Mark the picture and then prove it. Show ALL SIDES and ALL ANGLES ≅ !!!

Given: ΔVXW **is an isosceles triangle with base** $\overline{VW}$
$\overline{XP}$ **is an angle bisector of** $\angle VXW$
P **is the midpoint of** $\overline{VW}$
$\angle VPX \cong \angle WPX$

Prove: $\Delta PVX \cong \Delta PWX$

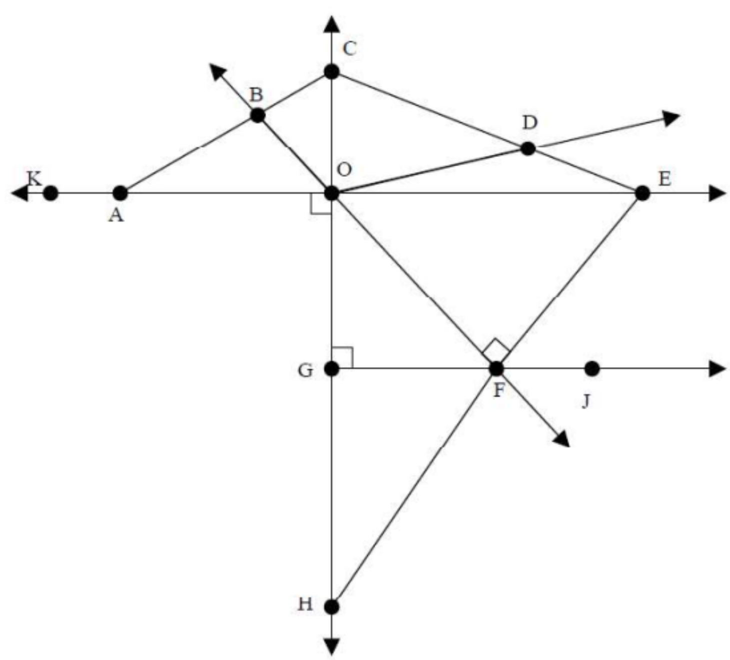


STATEMENTS	REASONS
1. ΔVXW is an isosceles triangle $\overline{XP}$ is an angle bisector of $\angle VXW$ P is the midpoint of $\overline{VW}$ $\angle VPX \cong \angle WPX$	1.
2. $\overline{XP} \cong \overline{XP}$	2.
3. $\overline{VX} \cong \overline{XW}$	3.
4.	4.
5. $\angle VXP \cong \angle WXP$	5.
6. $\angle XVP \cong \angle XWP$	6.
7. $\Delta PVX \cong \Delta PWX$	7.

5. Fill in the measure of every angle:

GIVEN:

$m\angle KAB = 148°$
$m\angle EOF = 45°$
$m\angle DEF = 65°$
$m\angle ODE = 145°$
$m\angle JFH = 122°$



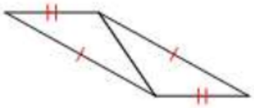
Name any isosceles triangles.

SSS and SAS

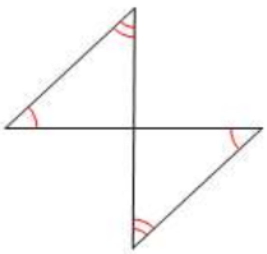
Hw Section 4.2

State if the two triangles are congruent. If they are, state why.

1.



2.



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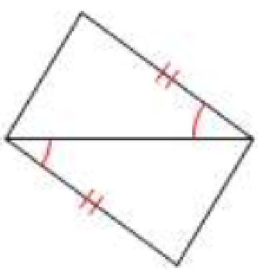

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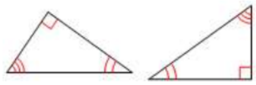

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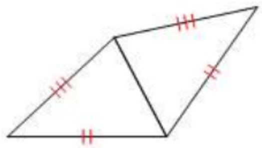

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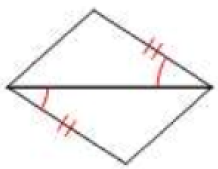

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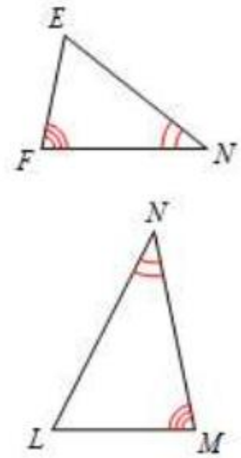

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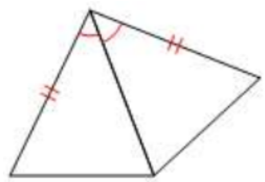

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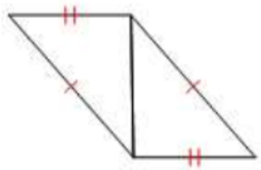

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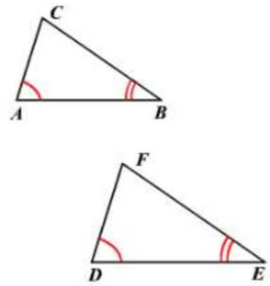

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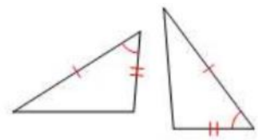
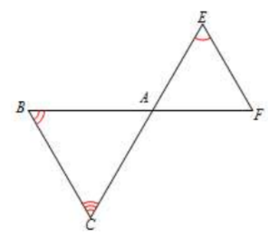
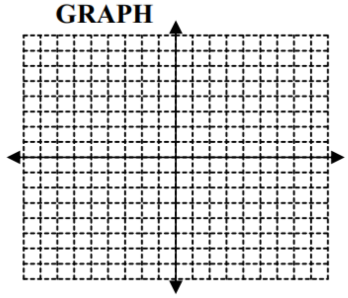
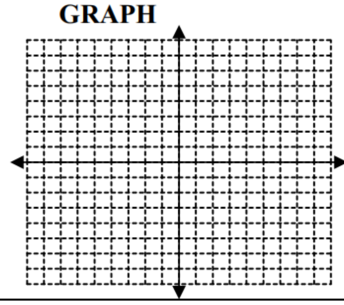


12.

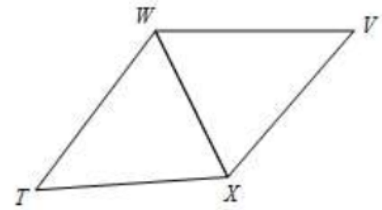


ALGEBRA REVIEW		
SOLVE $5-2(3x-4)=-7$	**GRAPH** $y=-x$ 	**MULTIPLY** $(5x-3)(2x+3)$
SOLVE $\frac{2x-1}{6}=\frac{x}{4}$	**GRAPH** $y=\frac{2}{3}x$ 	**FACTOR** $x^2-10x-24$

Mark the picture. Answer the question. Prove it.

13.
Given: $\angle TWX \cong \angle VWX$
$\overline{TW} \cong \overline{WV}$

Prove: $\Delta XWV \cong \Delta XWT$



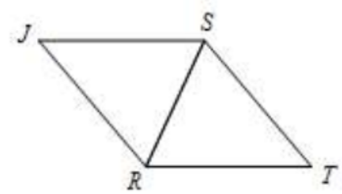
WHY ARE THE TWO TRIANGLES CONGRUENT?____________

STATEMENTS	REASONS

Mark the picture. Answer the question. Prove it.

14.
Given: $\overline{ST} \cong \overline{SJ}$
$\overline{JR} \cong \overline{TR}$

Prove: $\Delta RST \cong \Delta RSJ$



WHY ARE THE TWO TRIANGLES CONGRUENT?____________

STATEMENTS	REASONS

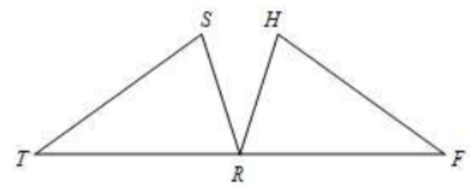
SSS and SAS

Application Section 4.2

1. Mark the picture, state why the two triangles are congruent, then prove it!

Given: $\angle SRT \cong \angle HRF$
R is the midpoint of $\overline{TF}$
$\overline{SR} \cong \overline{HR}$

Prove: $\Delta TSR \cong \Delta FRH$

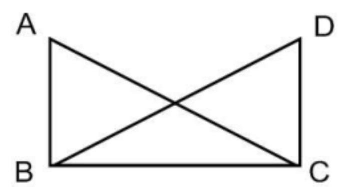


STATEMENTS	REASONS

2. Mark the picture, state why the two triangles are congruent, then prove it!

Given: $\overline{AB} \cong \overline{DC}$
$\angle ABC$ and $\angle DCB$ are right angles

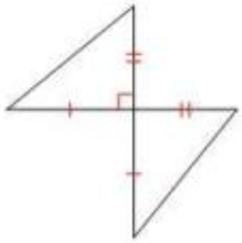
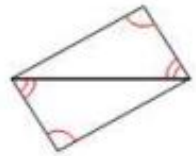
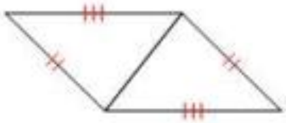
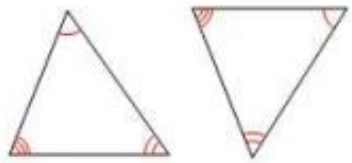
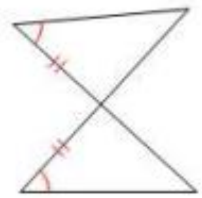
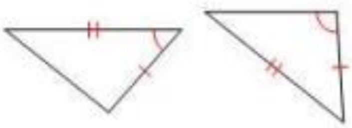
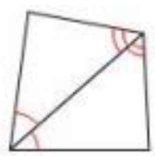
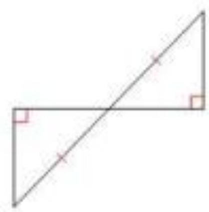
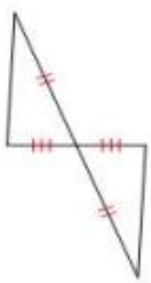
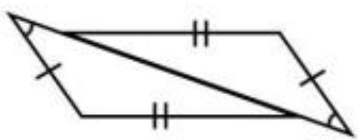
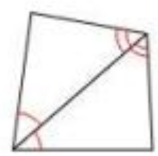
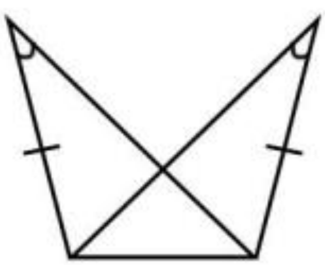
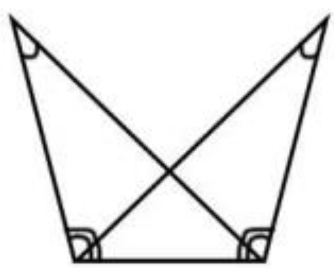
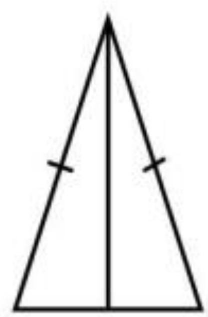
Prove: $\Delta ABC \cong \Delta DCB$



STATEMENTS	REASONS

AAS and ASA

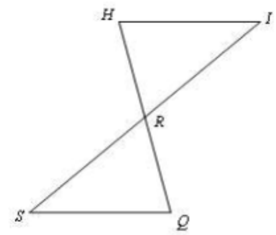
Hw Section 4.3

State if the two triangles are congruent. If they are, state why.		
1. 	2. 	3. 
4. 	5. 	6. 
7. 	8. 	9. 
10. 	11. 	12. 
13. 	14. 	15. 

Mark the picture. Answer the question. Prove it.

16.
Given: R **is the midpoint of** $\overline{SI}$
$\overline{HI} \parallel \overline{SQ}$

Prove: $\Delta RQS \cong \Delta RHI$



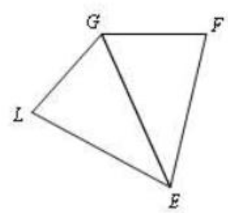
WHY ARE THE TWO TRIANGLES CONGRUENT?____________

STATEMENTS	REASONS

Mark the picture. Answer the question. Prove it.

17.
Given: $\overline{GE}$ **is the angle bisector of** $\angle LEF$
$\angle L \cong \angle F$

Prove: $\Delta LEG \cong \Delta FEG$



WHY ARE THE TWO TRIANGLES CONGRUENT?____________

STATEMENTS	REASONS

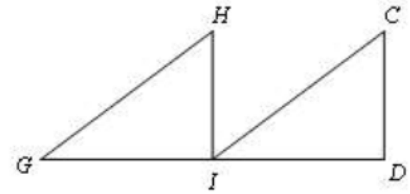
AAS and ASA

Application Section 4.3

1. Mark the picture, state why the two triangles are congruent, then prove it!

Given: $\angle HGI \cong \angle CID$
$\angle CDI$ **is a right angle**
$\overline{HI}$ **is the perpendicular bisector of** $\overline{GD}$

Prove: $\Delta HGI \cong \Delta CID$

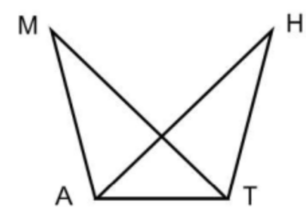


STATEMENTS	REASONS

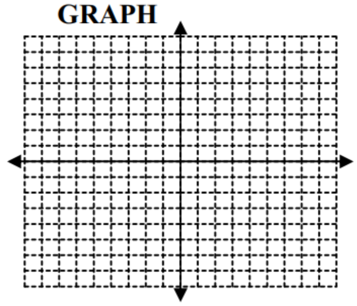
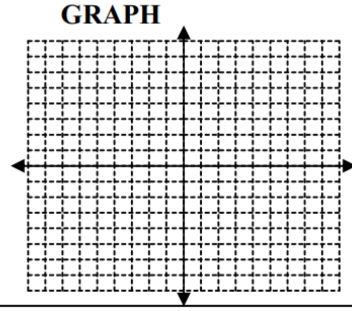
2. Mark the picture, state why the two triangles are congruent, then prove it!

Given: $\angle M \cong \angle H$
$\angle MAT \cong \angle HTA$

Prove: $\Delta MAT \cong \Delta HTA$



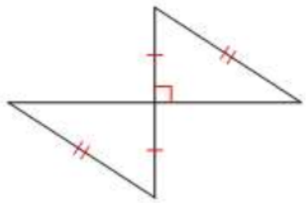
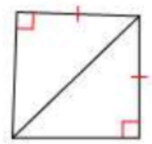
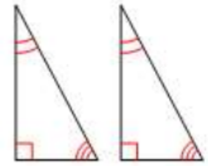
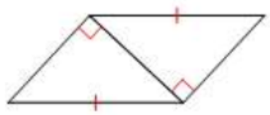
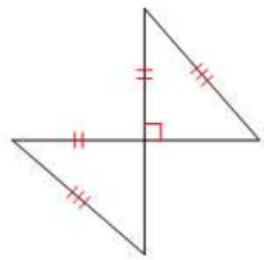
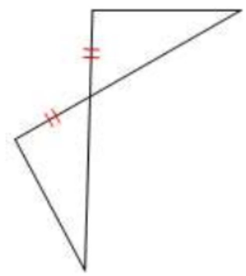
STATEMENTS	REASONS

ALGEBRA REVIEW		
SOLVE $26 = -7 + 3x - 3(2x - 4)$	**GRAPH** $y = -\frac{x}{2}$ 	**MULTIPLY** $(2x - 3)(3x + 4)$
SOLVE $\frac{2x - 1}{6} = \frac{x + 2}{4}$	**GRAPH** $y = x$ 	**FACTOR** $x^2 - 12x + 36$

HL

Hw Section 4.4

State if the two triangles are congruent. If they are, state why.

1.	2.	3.
		
4.	**5.**	**6.**
		

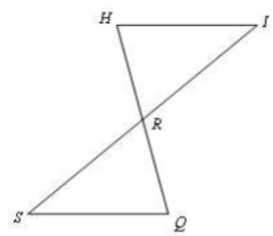
Mark the picture. Answer the question. Prove it.

7.

Given: ***R*** **is the midpoint of** $\overline{SI}$

$\angle S \cong \angle I$

Prove: $\angle Q \cong \angle H$



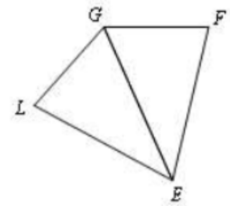
WHY ARE THE TWO TRIANGLES CONGRUENT?____________

STATEMENTS	REASONS

Mark the picture. Answer the question. Prove it.

8.
Given: $\overline{GE}$ **is the angle bisector of** $\angle LEF$
$\overline{LE} \cong \overline{FE}$

Prove: $\overline{LG} \cong \overline{FG}$

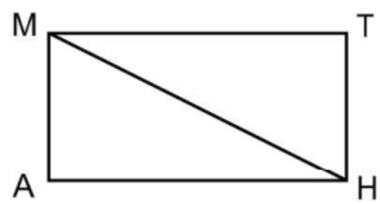


WHY ARE THE TWO TRIANGLES CONGRUENT?___________

STATEMENTS	REASONS

9.
Given: $\angle A$ **and** $\angle T$ **are right angles**
$\overline{MA} \cong \overline{TH}$

Prove: $\angle MHA \cong \angle HMT$



WHY ARE THE TWO TRIANGLES CONGRUENT?___________

STATEMENTS	REASONS

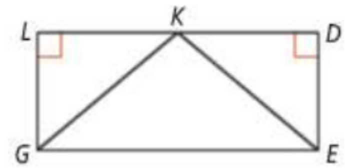
HL

Application Section 4.4

1. Mark the picture, state why the two triangles are congruent, then prove it!

Given: $\triangle GKE$ is isosceles with base $\overline{GE}$, $\angle L$ and $\angle D$ are right angles, and K is the midpoint of $\overline{LD}$.

Prove: $\overline{LG} \cong \overline{DE}$

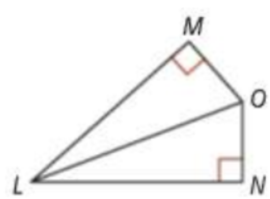


STATEMENTS	REASONS

2. Mark the picture, state why the two triangles are congruent, then prove it!

Given: $\overline{LO}$ bisects $\angle MLN$, $\overline{OM} \perp \overline{LM}$, $\overline{ON} \perp \overline{LN}$

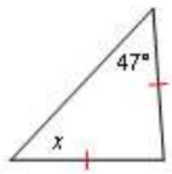
Prove: $\triangle LMO \cong \triangle LNO$



STATEMENTS	REASONS

Fill in all of the missing angles to help you find x.

3.



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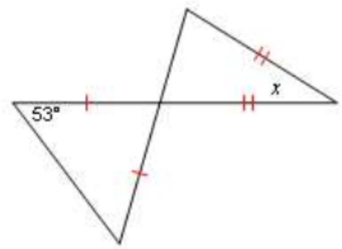

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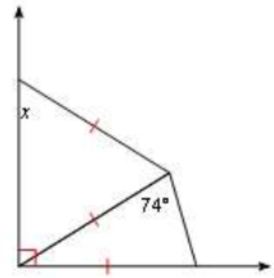

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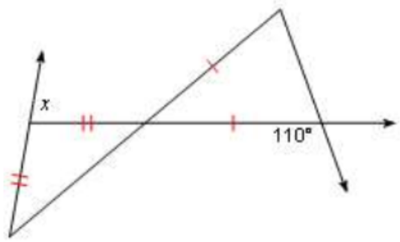

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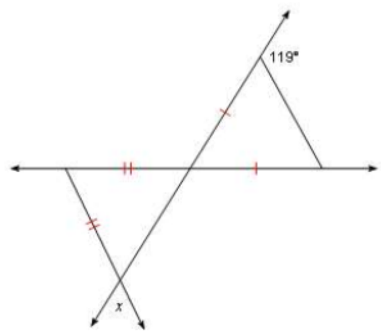

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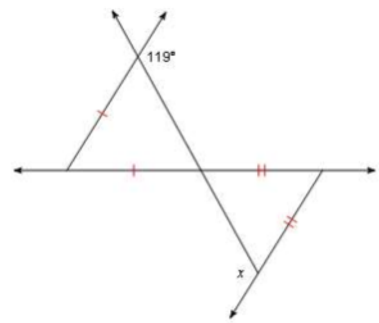


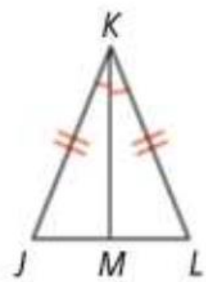
Use the picture to find the following:

9. If $m\angle L = 58$, then $m\angle LKJ$ = __?__.

10. If $JL = 5$, then ML = __?__.

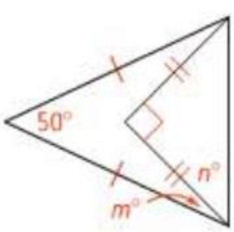
11. If $m\angle JKM = 48$, then $m\angle J$ = __?__.

12. If $m\angle J = 55$, then $m\angle JKM$ = __?__.

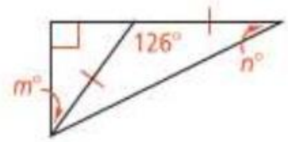


Algebra Find the values of m and n.

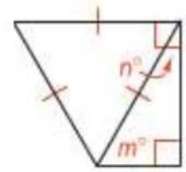
13.



14.



15.



Triangle Congruence

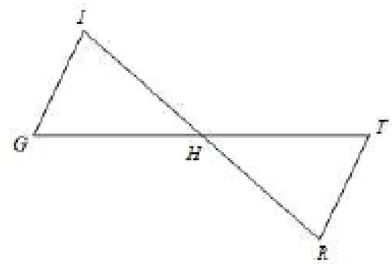
Chapter 4 Review 1

For each proof, mark the picture and complete the proof.

#1)

Given: $\overline{GI} \parallel \overline{TR}$
H is the midpoint of $\overline{GT}$
$\overline{GI} \cong \overline{RT}$
$\overline{HR} \cong \overline{IH}$

Prove: $\Delta GHI \cong \Delta THR$

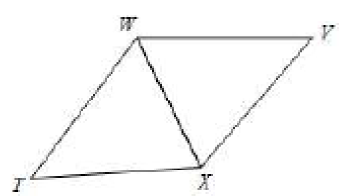


STATEMENTS	REASONS
1. $\overline{GI} \parallel \overline{TR}$ H is the midpoint of $\overline{GT}$ $\overline{GI} \cong \overline{RT}$ $\overline{HR} \cong \overline{IH}$	1.
2. $\overline{GH} \cong \overline{HT}$	2.
3. $\angle G \cong \angle T$	3. Alternate Interior Angles Theorem
4. $\angle I \cong \angle R$	4.
5.	5.
6. $\Delta GHI \cong \Delta THR$	6. Definition of Congruent Triangles

#2)

Given: $\angle TWX \cong \angle VWX$
$\overline{TW} \cong \overline{WV}$

Prove: $\Delta XWV \cong \Delta XWT$



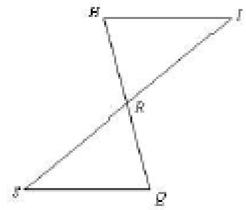
STATEMENTS	REASONS

#3)

Given: R is the midpoint of $\overline{SI}$

$\overline{HI} \parallel \overline{SQ}$

Prove: $\Delta RQS \cong \Delta RHI$



STATEMENTS	REASONS

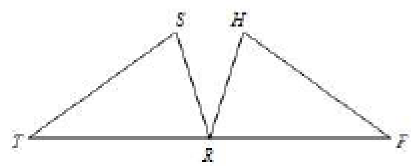
#4)

Given: $\angle SRT \cong \angle HRF$

R is the midpoint of $\overline{TF}$

$\overline{SR} \cong \overline{HR}$

Prove: $\Delta TSR \cong \Delta FRH$

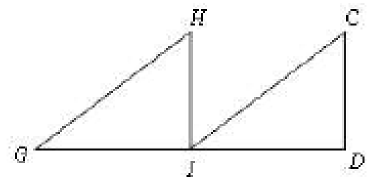


STATEMENTS	REASONS

#5)

Given: $\angle HGI \cong \angle CID$
$\angle CDI$ is a right angle
$\overline{HI}$ is the perpendicular bisector of $\overline{GD}$

Prove: $\Delta HGI \cong \Delta CID$

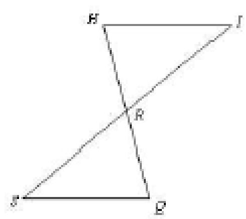


STATEMENTS	REASONS

#6)

Given: R is the midpoint of $\overline{SI}$
$\angle S \cong \angle I$

Prove: $\angle Q \cong \angle H$

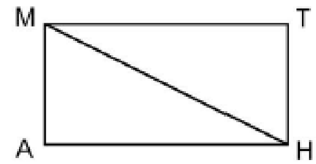


STATEMENTS	REASONS

#7)

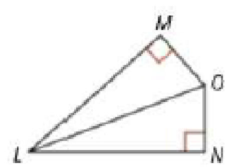
Given: $\angle A$ and $\angle T$ are right angles
$\overline{MA} \cong \overline{TH}$

Prove: $\angle MHA \cong \angle HMT$



STATEMENTS	REASONS

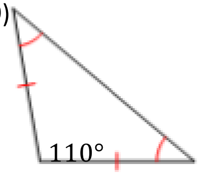
#8) Given: $\overline{LO}$ bisects $\angle MLN$
$\overline{OM} \perp \overline{LM}, \overline{ON} \perp \overline{LN}$
Prove: $\Delta LMO \cong \Delta LNO$



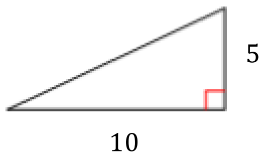
STATEMENTS	REASONS

Classify each triangle by its sides and angles.

#9)

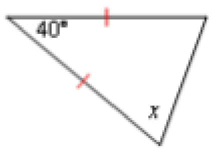


#10)

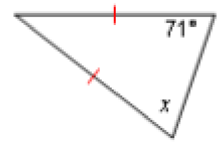


Find the value of x.

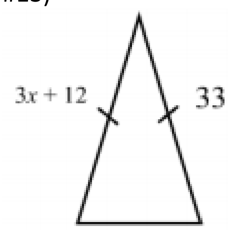
#11)



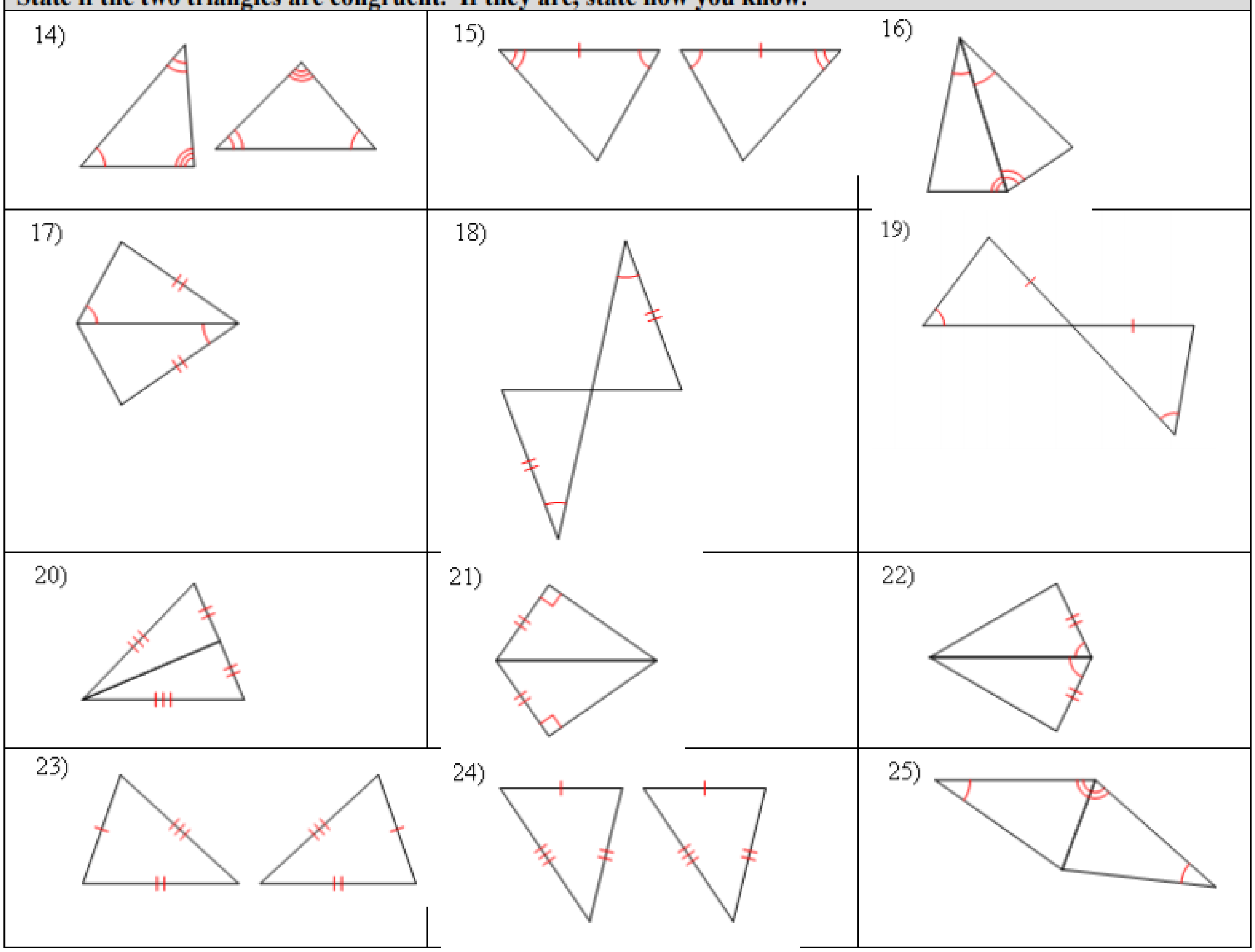
#12)



#13)

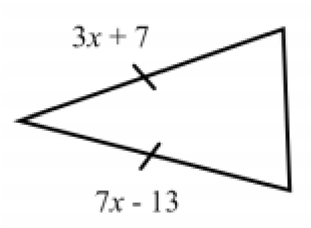


State if the two triangles are congruent. If they are, state how you know.

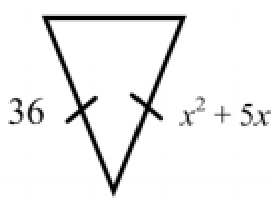


Find the value of x.

#26)

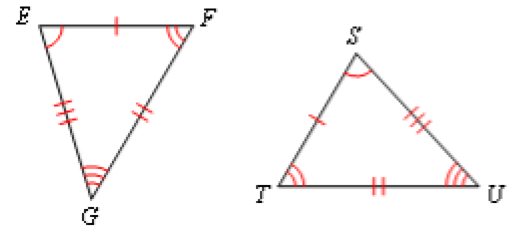


#27)



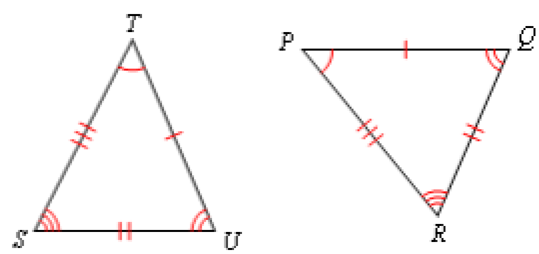
Finish the congruence statement.

#28)



$\Delta EFG \cong$ ________________

#29)



$\Delta STU \cong$ ________________

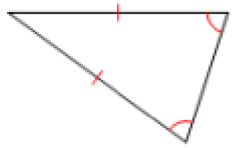
Triangle Congruence

Chapter 4 Review 2

Classify each triangle by its sides (scalene, isosceles, or equilateral) as well as by its angles (acute, obtuse, or right).

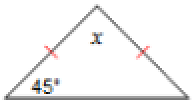
1)

2)

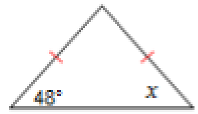


Find the value of *x*.

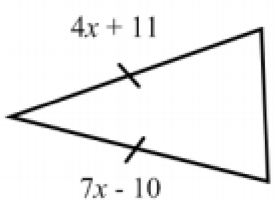
3)



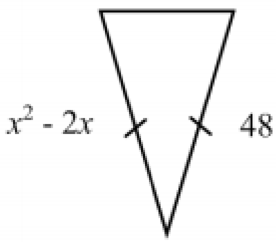
4)



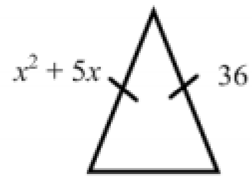
5)



6)



7)

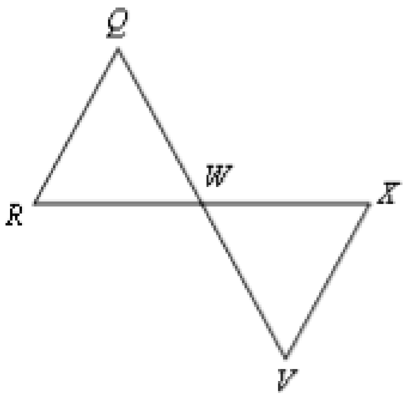


#8) What is the definition of an isosceles triangle?

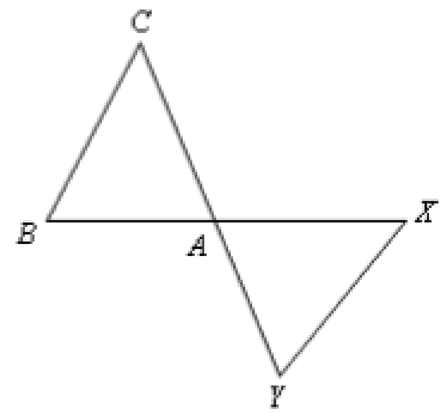
#9) What is the converse to the isosceles triangle theorem?

Mark the angles and sides of each pair of triangles to indicate that they are congruent.

10) $\Delta WXV \cong \Delta WRQ$



11) $\Delta ABC \cong \Delta AYX$



Complete each congruence statement by naming the corresponding angle or side.

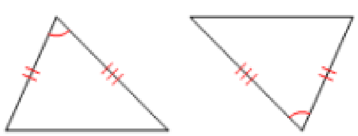
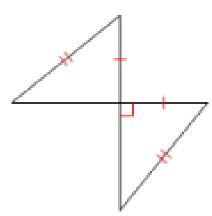
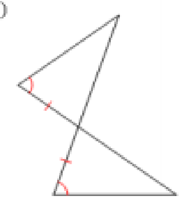
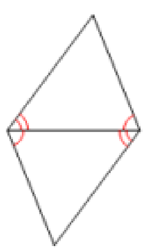
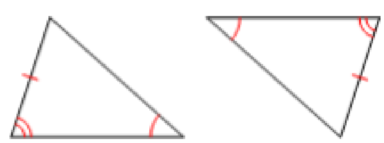
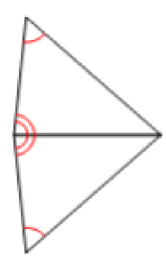
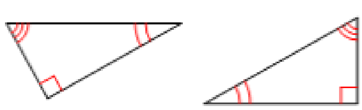
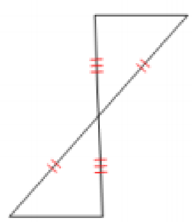
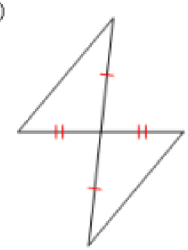
12) $\Delta FGH \cong \Delta JKL$

$\angle H \cong ?$

13) $\Delta DFE \cong \Delta XYZ$

$\overline{ED} \cong ?$

State if the two triangles are congruent. If they are, state how you know.

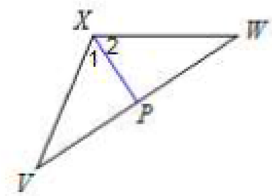
26) 	27) 	28) 
29) 	30) 	31) 
32) 	33) 	34) 

For each proof, mark the picture and complete the proof.

#23)

Given: ΔVXW is an isosceles triangle with base $\overline{VW}$
$\overline{XP}$ is an angle bisector of $\angle VXW$
P is the midpoint of $\overline{VW}$
$\angle VPX \cong \angle WPX$

Prove: $\Delta PVX \cong \Delta PWX$

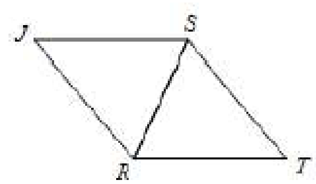


STATEMENTS	REASONS
1. ΔVXW is an isosceles triangle $\overline{XP}$ is an angle bisector of $\angle VXW$ P is the midpoint of $\overline{VW}$ $\angle VPX \cong \angle WPX$	1.
2. $\overline{XP} \cong \overline{XP}$	2.
3. $\overline{VX} \cong \overline{XW}$	3.
4.	4.
5. $\angle VXP \cong \angle WXP$	5.
6. $\angle XVP \cong \angle XWP$	6.
7. $\Delta PVX \cong \Delta PWX$	7.

#24)

Given: $\overline{ST} \cong \overline{SJ}$
$\overline{JR} \cong \overline{TR}$

Prove: $\Delta RST \cong \Delta RSJ$



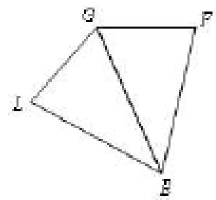
STATEMENTS	REASONS

#25)

Given: $\overline{GE}$ **is the angle bisector of** $\angle LEF$

$\angle L \cong \angle F$

Prove: $\Delta LEG \cong \Delta FEG$



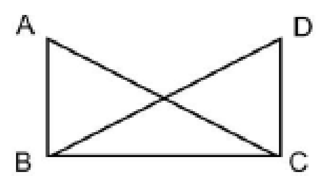
STATEMENTS	REASONS

#26)

Given: $\overline{AB} \cong \overline{DC}$

$\angle ABC$ and $\angle DCB$ are right angles

Prove: $\Delta ABC \cong \Delta DCB$

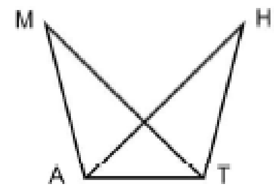


STATEMENTS	REASONS

#27)

Given: $\angle M \cong \angle H$
$\angle MAT \cong \angle HTA$

Prove: $\Delta MAT \cong \Delta HTA$

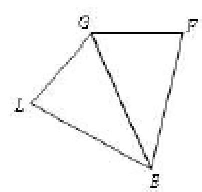


STATEMENTS	REASONS

#28)

Given: $\overline{GE}$ is the angle bisector of $\angle LEF$
$\overline{LE} \cong \overline{FE}$

Prove: $\overline{LG} \cong \overline{FG}$

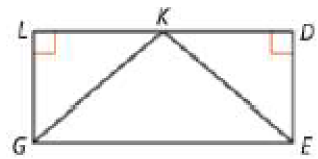


STATEMENTS	REASONS

#29)

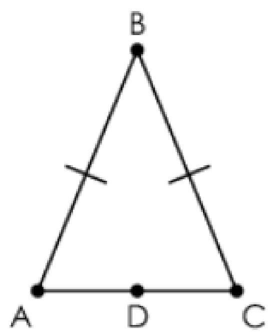
Given: $\triangle GKE$ is isosceles with base $\overline{GE}$, $\angle L$ and $\angle D$ are right angles, and K is the midpoint of $\overline{LD}$.

Prove: $\overline{LG} \cong \overline{DE}$



STATEMENTS	REASONS

#30) Prove the isosceles triangle theorem.



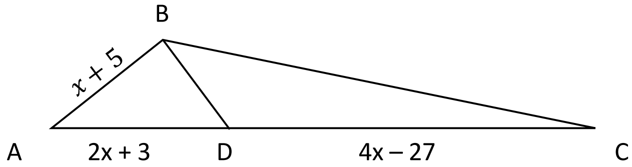
Given: Triangle ABC is isosceles. Point D is the midpoint of $\overline{AC}$.

Prove: $\angle BAC \cong \angle BCA$

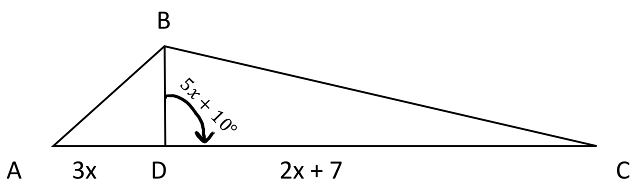
Bisectors, Medians and Altitudes

Hw Section 5.1

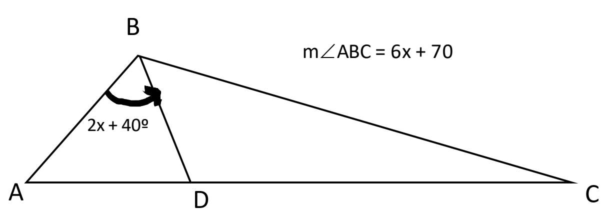
#1) Find AB if $\overline{BD}$ is a median of ΔABC.



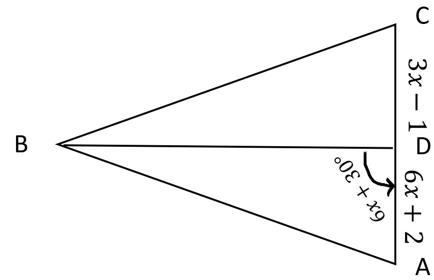
#2) Find AC if $\overline{BD}$ is an altitude of ΔABC.



#3) Find m$\angle$ABC if $\overline{BD}$ is an angle bisector of ΔABC.



#4) Find AC if $\overline{BD}$ is an altitude of ΔABC.



Draw and label a figure for each statement.

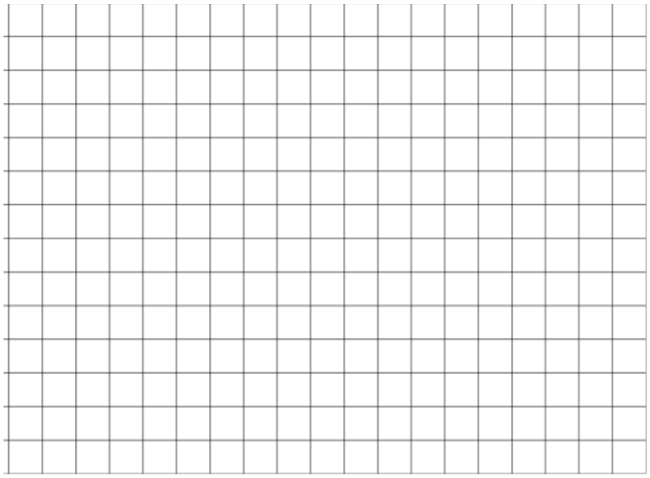
#5) Isosceles triangle ABC, with vertex angle A, where $\overline{AD}$ is an altitude, median, and angle bisector.

#6) ΔDEF is a right triangle with right angle at F. $\overline{FG}$ is a median of ΔDEF and $\overline{GH}$ is the perpendicular bisector of $\overline{DE}$.

#7) Three medians of a triangle intersecting in the interior of the triangle.

#8) Altitude $\overline{FA}$ on the exterior of ΔEFG.

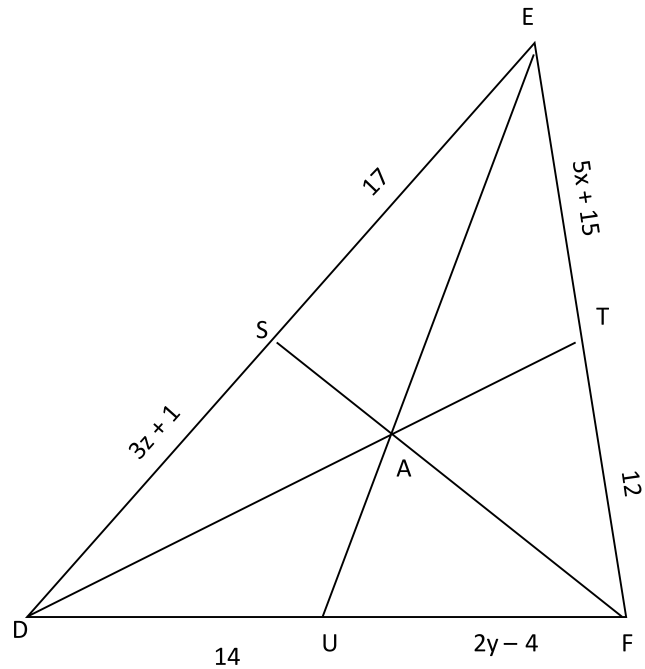
Answer each question if A(1, 6), B(13, 2), and C(-7, 12) are the vertices of ΔABC



#9) What are the coordinates of the midpoint of $\overline{AB}$?

#10) What is the slope of the perpendicular bisector of $\overline{AB}$?

#11) Points S, T, and U are the midpoints of $\overline{DE}$, $\overline{EF}$, and $\overline{DF}$, respectively. Find x, y, and z.



#1) 20
#2) 87
#3) 100
#4) 91
#5) - #8) See key
#9) (7, 4)
#10) 3
#11) $\left(-\frac{3}{5}, 9, \frac{16}{3}\right)$

Bisectors, Medians and Altitudes

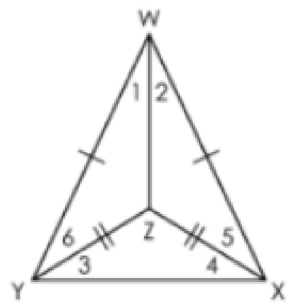
Hw Section 5.1B

End of Course Test Questions

The key to this section is on smacmathgeometry.weebly.com under "Air Test"

Question 44

Triangle YWX is shown.



Given: $\overline{WY}\cong\overline{WX}$, $\overline{ZY}\cong\overline{ZX}$

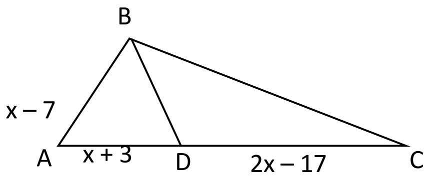
Prove: $\overline{WZ}$ bisects $\angle YWX$

Place statements and reasons in the blank boxes to complete the proof.

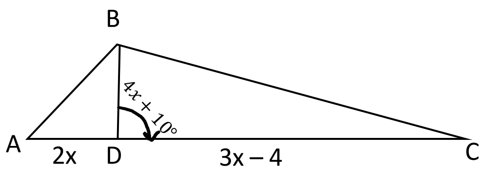
Statements	Reasons
$\overline{WY}\cong\overline{WX}$ $\overline{ZY}\cong\overline{ZX}$	Given
$\angle WYX\cong\angle WXY$ $\angle 3\cong\angle 4$	
$m\angle WYX = m\angle WXY$ $m\angle 3 = m\angle 4$	Measures of congruent angles are equal.
$m\angle WYX = m\angle 6 + m\angle 3$ $m\angle WXY = m\angle 5 + m\angle 4$	
$m\angle 6 + m\angle 3 = m\angle 5 + m\angle 4$	Substitution
	Substitution
$m\angle 6 = m\angle 5$	
	SAS
$\angle YWZ\cong\angle XWZ$	
$\overline{WZ}$ bisects $\angle YWX$	

$m\angle 6 + m\angle 3 = m\angle 5 + m\angle 3$	$\triangle WYZ\cong\triangle WXZ$	Addition Property of Equality
$m\angle 6 = m\angle 5 + m\angle 4 - m\angle 3$	$\triangle WYX\cong\triangle ZYX$	Substitution
$m\angle 6 + m\angle 3 = m\angle 3 + m\angle 4$	Corresponding parts of congruent triangles are congruent.	Angle Addition Postulate
Base angles of isosceles triangles are congruent.	Definition of angle bisector	Reflexive Property
Corresponding parts of similar triangles are congruent.		

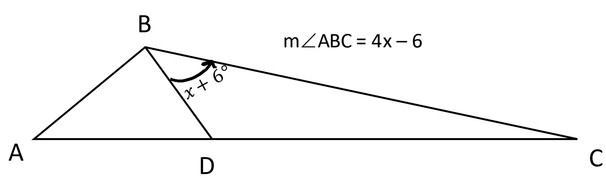
#1) Find AB if $\overline{BD}$ is a median of ΔABC.



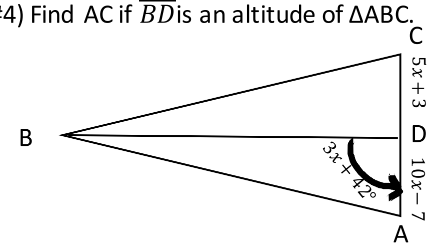
#2) Find AC if $\overline{BD}$ is an altitude of ΔABC.



#3) Find m∠ABC if $\overline{BD}$ is an angle bisector of ΔABC.



#4) Find AC if $\overline{BD}$ is an altitude of ΔABC.



State whether each sentence is always, sometimes, or never true.

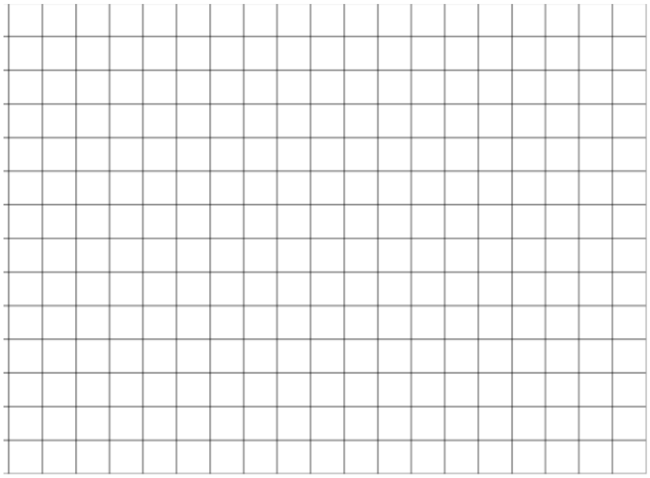
#5) A median is an angle bisector.

#6) A median is an altitude.

#7) In an equilateral triangle, a median is also an angle bisector and is also an altitude.

#8) An altitude is on the exterior of a triangle.

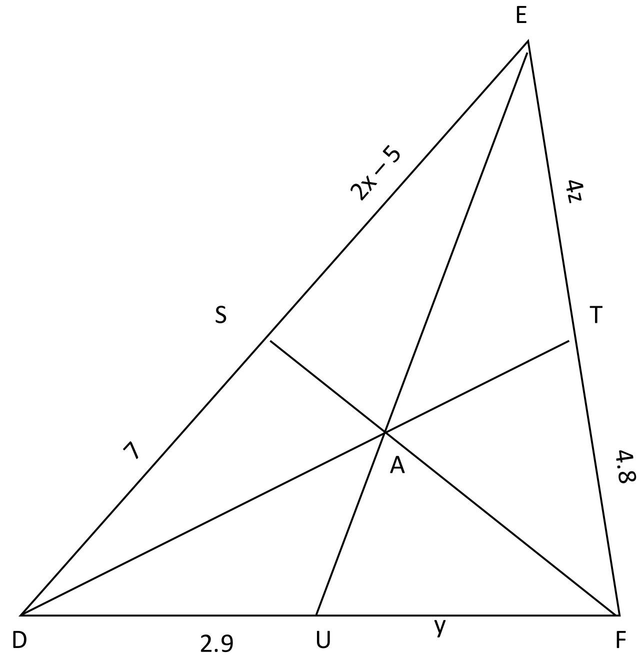
Answer each question if A(5, 10), B(12, -1), and C(-6, 8) are the vertices of ΔABC



#9) What are the coordinates of K if $\overline{CK}$ is a median of ΔABC?

#10) What is the slope of the perpendicular bisector of $\overline{AB}$? What is the slope of $\overline{CL}$ if $\overline{CL}$ is the altitude from point C?

#11) Points S, T, and U are the midpoints of $\overline{DE}$, $\overline{EF}$, and $\overline{DF}$, respectively. Find x, y, and z.



#1) 13
#2) 96
#3) 30°
#4) 236
#5) Sometimes
#6) Sometimes
#7) Always
#8) Sometimes
#9) $\left(\frac{17}{2,} \ \frac{9}{2}\right)$
#10) $\frac{7}{11}, \frac{7}{11}$
#11) x = 6, y = 2.9, z = 1.2

Solving Systems of Equations

Hw Section 6.1

Solve each system of equations by substitution or elimination. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

#1) $x = 3$
$2y + x = 3$

#2) $y = 2$
$2x - 4y = 1$

#3) $y = 2x - 7$
$3x - y = 7$

#4) $-4x - 2y = -12$
$4x + 8y = -24$

#5) $-2x - 9y = -25$
$-4x - 9y = -23$

#6) $x = 2y$
$.25x + .5y = 10$

#7) $3x + 2y = 0$
$x - 5y = 17$

#8) $2x + 3y = 6$
$x + 2y = 5$

#9) $3x - y = 2$
$x + 2y = 3$

#10) $4x + 5y = 6$
$6x - 7y = -20$

#11) $y = 4x$
$x + y = 5$

#12) $x = -4y$
$3x + 2y = 20$

#13) $y = x - 1$
$x + y = 3$

#16) $x - 5y = 10$
$2x - 10y = 20$

#14) $3x - y = 4$
$2x - 3y = -9$

#17) $x + 4y = 8$
$2x - 5y = 29$

#15) $x + 5y = 4$
$3x + 15y = -1$

#18) $4x + y = 0$
$x + 2y = -7$

#19) $2x - 3y = -24$
$x + 6y = 18$

#20) $x + 14y = 84$
$2x - 7y = -7$

Answers

#1) (3, 0)
#2) $\left(\frac{9}{2}, 2\right)$
#3) (0 , -7)
#4) $(6, -6)$
#5) $(-1, 3)$
#6) (20, 10)
#7) (2, -3)

#8) (-3, 4)
#9) (1, 1)
#10) (-1, 2)

#11) (1 ,4)
#12) (8, -2)
#13) (2, 1)
#14) (3, 5)

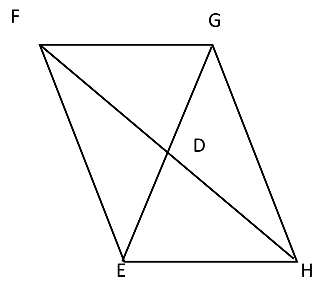
#15) no solution
#16) infinitely many solutions.
#17) (12, -1)

#18) (1, -4)
#19) (-6, 4)
#20) (14, 5)

Parallelograms

Hw Section 6.2

EFGH is a parallelogram. Determine whether each statement must be true. If it must be true, then state the theorem or definition that justifies the statement.



#1) $\overline{FE} \mathbin{//} \overline{GH}$

#2) ΔFDE ≅ ΔHDG

#3) ∠FGH ≅ ∠FEH

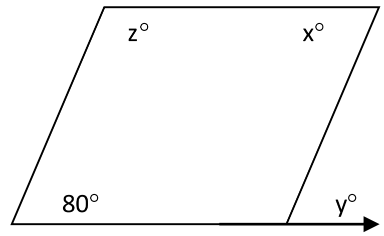
#4) $\overline{FD} \cong \overline{DG}$

#5) ΔFHE ≅ ΔGHE

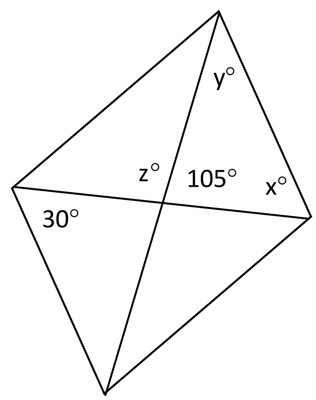
#6) $DE = \frac{1}{2} EG$

If each quadrilateral is a parallelogram, find the value of x, y, and z.

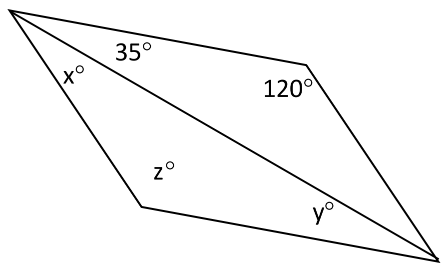
#7)



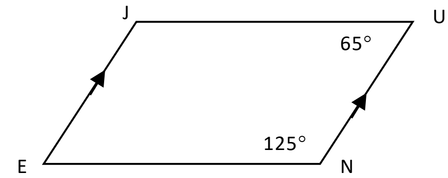
#8)



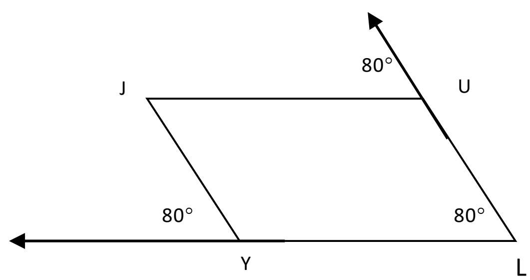
#9)



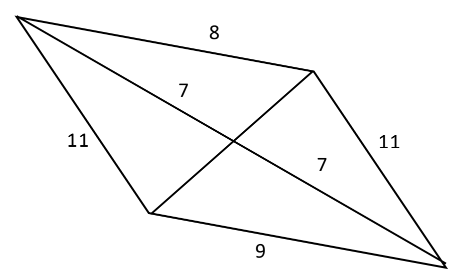
#11)



Is each quadrilateral a parallelogram? Justify your answer.
#10)



#12) Explain why it is impossible for the figure to be a parallelogram.



#13) Given parallelogram PQRS with $m\angle P = y$ and $m\angle Q = 4y + 20$, find measures of $\angle R$ and $\angle S$.

#14) Given parallelogram ABCD with $m\angle C = x + 75$ and $m\angle D = 3x - 199$, find the measures of each angle.

#15) Find all the possible ordered pairs for the fourth vertex of a parallelogram with vertices at J(1,1), U(3, 4), and N(7,1).

#16) If NCTM is a parallelogram, $m\angle N = 12x + 10y + 5$, $m\angle C = 9x$, and $m\angle T = 6x + 15y$, find $m\angle M$.

#17) NCSM is a parallelogram with diagonals $\overline{NS}$ and $\overline{MC}$ that intersect at point P. If NP = 4x + 20, NS = 13x, PC = x + y, and PM = 2y – 2, find CM

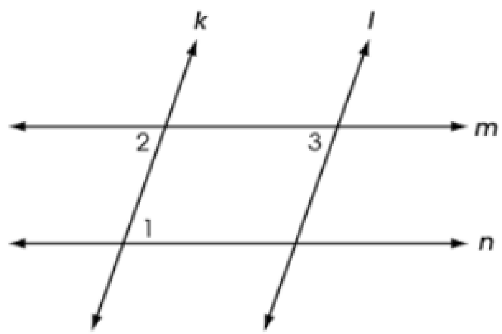
#1) True, Def'n of Parallelogram
#2) True, Vertical Angles Theorem, diagonals of parallelogram bisect each other, and SAS Theorem.
#3) True, opposite angles of a parallelogram are ≅
#4) False
#5) False
#6) True, diagonals of a parallelogram bisect each other.
#7) (80, 80, 100)
#8) (30, 45, 75)
#9) (25, 35, 120)
#10) Yes. The opposite sides are parallel because of the converse to the corresponding angles postulate. Thus, JULY is a parallelogram by definition of a parallelogram.
#11) No, because consecutive interior angles are not supplementary.

#12) In a parallelogram, opposite sides are congruent. In this figure the opposite sides of 8 and 9 are not congruent.
#13) m$\angle$R = 32, m$\angle$S = 148
#14) m$\angle$A = 151, m$\angle$B = 29, m$\angle$C = 151, m$\angle$D = 29
#15) (9, 4), (5, -2), (-3, 4)
#16) 45
#17) 36

End of Course Test Questions

Question 13

Two pairs of parallel lines intersect to form a parallelogram as shown.



Place statements and reasons in the table to complete the proof that the opposite angles of a parallelogram are congruent.

Statements		Reasons	
1.	$m \parallel n$ $k \parallel l$	1.	Given
2.		2.	
3.		3.	
4.		4.	

$\angle 1 \cong \angle 2$

$\angle 1 \cong \angle 3$

$\angle 2 \cong \angle 3$

$\angle 1 \cong \angle 1$

Alternate exterior angles are congruent.

Alternate interior angles are congruent.

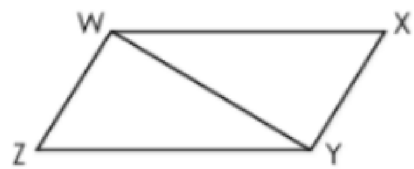
Transitive property of congruence

Opposite angles are congruent.

Corresponding angles are congruent.

Question 21

A parallelogram and incomplete proof are shown.



Given: WXYZ is a parallelogram.
Prove: $\overline{WX} \cong \overline{YZ}$

Place reasons in the table to complete the proof.

Statements	Reasons
1. WXYZ is a parallelogram.	1. Given
2. $\overline{WX} \parallel \overline{YZ}$ $\overline{WZ} \parallel \overline{XY}$	2. Definition of a parallelogram
3. $\angle ZWY \cong \angle XYW$ $\angle ZYW \cong \angle XWY$	3.
4. $\overline{WY} \cong \overline{WY}$	4.
5. $\triangle WYZ \cong \triangle YWX$	5.
6. $\overline{WX} \cong \overline{YZ}$	6.

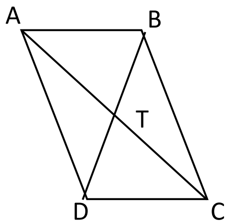
Corresponding angles are congruent.	SSS	Transitive property
Alternate exterior angles are congruent.	SAS	Reflexive property
Alternate interior angles are congruent.	ASA	Angle addition postulate
Corresponding parts of congruent triangles are congruent.	AA	Corresponding parts of congruent triangles are similar.

Tests for Parallelograms

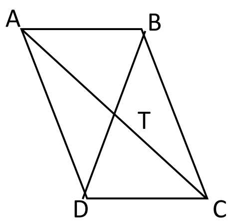
Hw Section 6.3

Use parallelogram ABCD and the given information to find each value.

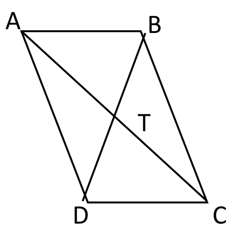
#1) m∠ABC = 137. Find m∠DAB.



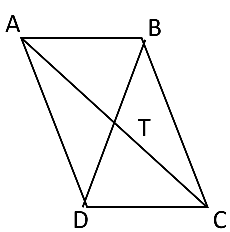
#2) AC = 5x – 12 and AT = 14. Find x.



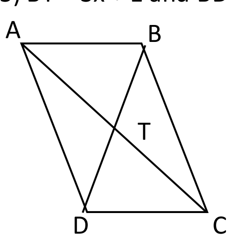
#3) AB = 6, BC = 9 and m∠ABC = 80. Find CD.



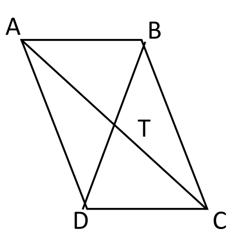
#4) BC = 4x + 7 and AD = 8x – 5. Find x.



#5) BT = 3x + 1 and BD = 4x + 8. Find x.



#6) m∠BCD = 3x + 14 and m∠ADC = x + 10. Find m∠ADC.



#7) Draw a quadrilateral that has two pairs of congruent sides, but is not a parallelogram.

#8) Draw a quadrilateral that is not a parallelogram and has one pair of parallel sides and one pair of congruent sides.

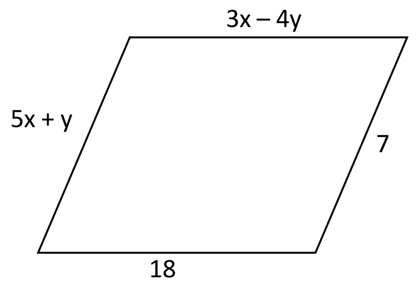
Determine if each conditional is true or false. If it is false, draw a counterexample.

#9) If the opposite angles in a quadrilateral are congruent, then the quadrilateral is a parallelogram.

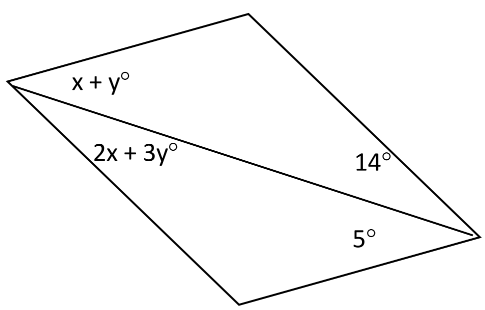
#10) If the diagonals in a quadrilateral are the same length, then the quadrilateral is a parallelogram.

What values must x and y have in order that the quadrilateral is a parallelogram?

#11)



#12)

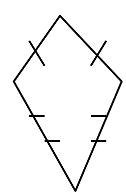


Determine whether ABCD is a parallelogram given each set of vertices.

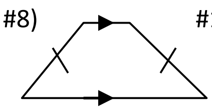
#13) A(8, 10), B(16, 17), C(16, 11), D(8, 4)

#14) A(8, 6), B(6, 0), C(4, 2), D(7, 3)

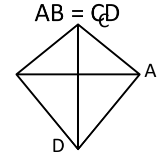
#1) 43
#2) 8
#3) 6
#4) 3
#5) 3
#6) 49
#7)



#8)



#10) AB = CD



#9) True
#11) (2, -3)
#12) (1, 4)
#13) Yes, because the diagonals have the same midpoint.
#14) No, because the diagonals have different midpoints

Quadrilaterals

Review 6.1 – 6.3

For #1-4, Determine if each statement is true or false.

#1) A quadrilateral is a parallelogram if it has both pairs of opposite angles congruent.

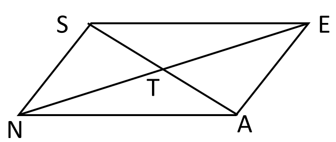
#2) A quadrilateral is a parallelogram if it has one pair of opposite sides congruent.

#3) A quadrilateral is a parallelogram if it has one pair of opposite sides parallel and the other pair of opposite sides congruent.

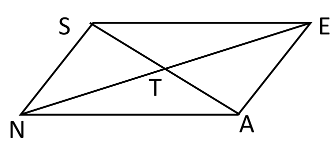
#4) A quadrilateral can have 5 sides.

For #5-8, Use parallelogram NAES.

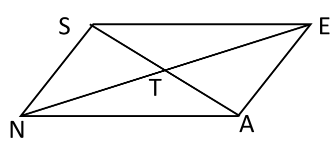
#5) If NT = 4x + 6, and TE = 5x + 4, find NE.



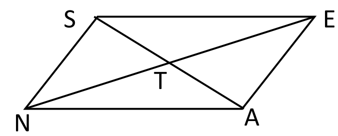
#6) If NS = 5 – 3y, SE = 2x + 1, EA = y + 1, and AN = x + 5, find the values of x and y.



#7) If m∠SNA = 5c + 6 and m∠SEA = 7c – 4, find m∠SNA.



#8) If m∠NSE = 8f + 10 and m∠SEA = 4f – 10, then find m∠EAN.

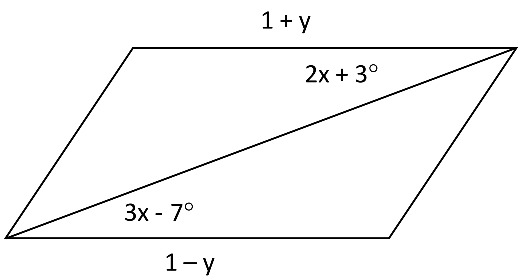


Determine whether ABCD is a parallelogram given each set of vertices. EXPLAIN your answer.

#9) A(2, 5), B(3, -1), C(6, 3), D (5, 9)

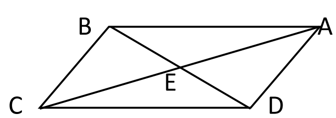
#10) In quadrilateral GOAT, segment GA bisects segment OT at N, and segment GN is congruent to segment NA. Must GOAT be a parallelogram? Circle Yes or NO.

What values must x and y have in order for each quadrilateral to be a parallelogram?

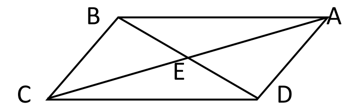


The figure BADC is a parallelogram. Use this figure and the information given to solve each problem.

#12) If $m\angle BCD = 35$, find $m\angle BAD$.



#13) If AB = 6x – 3 and CD = 2x + 9, find AB.



Find the ordered pair that satisfies the system of equations.

#14) $3x - y = 2$
$x + 2y = 3$

#15) $2x + 3y = 6$
$x + 2y = 5$

#1) True	#2) False	#3) False
#4) False	#5) NE = 28	#6) (4, 1)

#7) $m\angle SNA = 31$ #8) $m\angle EAN = 130$

#9) Yes, because the diagonals bisect each other. (answers vary)

#10) Yes

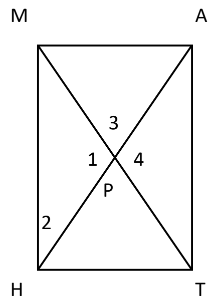
#11) (10, 0)	#12) 35	#13) 15
#14) (1, 1)	#15) (-3, 4)	

Rectangles

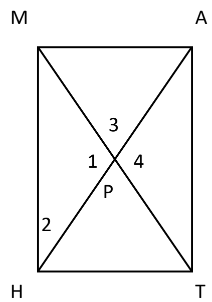
Hw Section 6.4

Use rectangle MATH and MNRS with the given information to solve each problem.

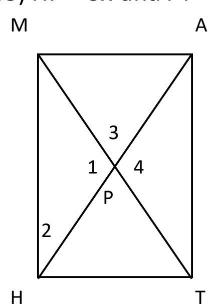
#1) HP = 6, find HA



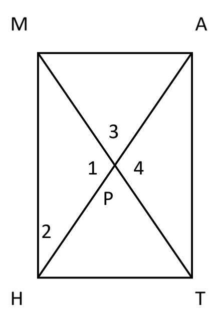
#2) MH = 8, find AT.



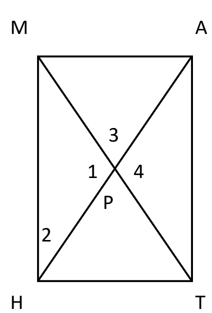
#3) HP = 3x and PT = 18, find x.



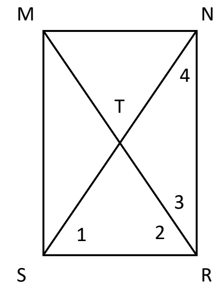
#4) $m\angle 1 = 55$, find $m\angle 2$.



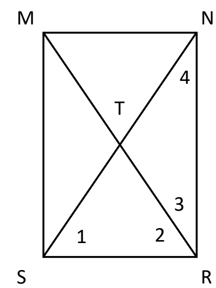
#5) $m\angle 3 = 110$, find $m\angle 4$.



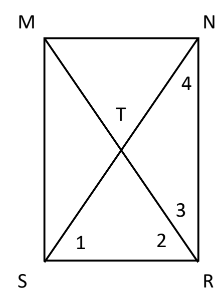
#6) If $m\angle 1 = 32$, find the $m\angle 2$, $m\angle 3$, and $m\angle 4$.



#7) If ST = 14.25, find MR.



#8) If $m\angle MTN = 116$, find $m\angle 1$ and $m\angle 4$.



Draw a counterexample to show that each statement below is false.

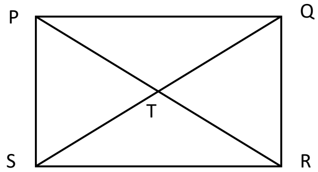
#9) If a quadrilateral has congruent diagonals, then it is a rectangle.

#10) If a quadrilateral has opposite sides congruent, then it is a rectangle.

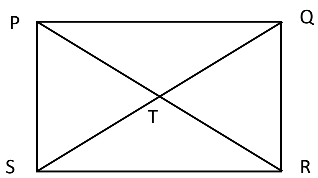
#11) If a quadrilateral has diagonals that bisect each other, then it is a rectangle.

Find the values of x and y in rectangle PQRS.

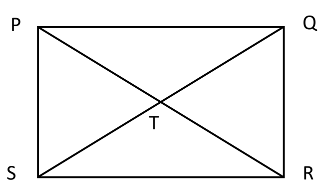
#12) PT = 3x – y, ST = x + y, TQ = 5



13) PS = y, QR = x + 7, PQ = y – 2x, SR = x + 1



#14) PT = x + y, ST = 2y – 7, PR = -3x



Determine whether ABCD is a rectangle. Explain

#15) A(12, 2), B(12, 8), C(-3, 8), D(-3, 2)

#16) A(0, -3), B(4, 8), C(7, -4), D(11, 7)

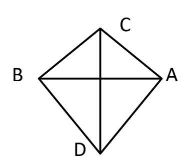
#1) 12 #2) 8 #3) 6

#4) 62.5 #5) 70 #6) 32, 58, 58

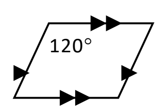
#7) 28.5 #8) 32, 58

#9) CD = AB

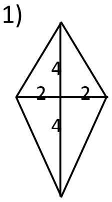
m∠ADB = 70°



#10)



#11)



#12) (2.5, 2.5) #13) (3, 10) #14) (-2, 5)

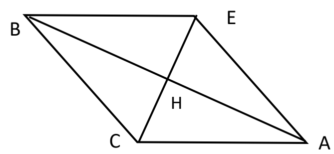
#15) Yes, opposite sides are parallel and consecutive sides are perpendicular.

#16) No, opposite sides are not parallel.

Squares and Rhombi

Hw Section 6.5

Use rhombus BEAC with BA = 26 to determine whether each statement is true or false. Justify your answer.



#1) CE = 26

#2) HA = 13

#3) $\overline{BA} \perp \overline{EC}$

#4) ΔBHE ≅ ΔAHC

#5) m∠BEH = m∠EBH

#6) ∠CBE and ∠BCA are supplementary

Circle all the quadrilaterals – parallelogram, rectangle, rhombus, or square – that have each property.

#7) All angles are congruent.
parallelogram, rectangle, rhombus, or square

#8) The opposite sides are parallel.
parallelogram, rectangle, rhombus, or square

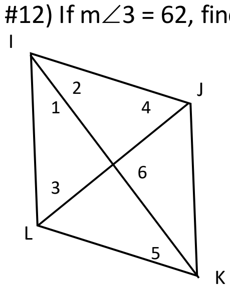
#9) All sides are congruent.
parallelogram, rectangle, rhombus, or square

#10) The opposite sides are congruent.
parallelogram, rectangle, rhombus, or square

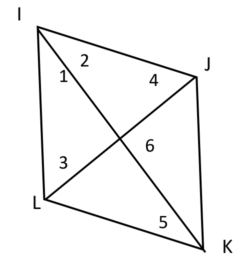
#11) It is equiangular and equilateral.
parallelogram, rectangle, rhombus, or square

Use rhombus IJKL and the given information to solve each problem.

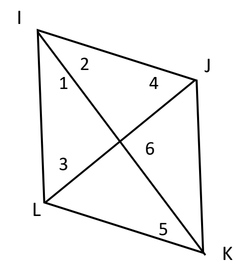
#12) If m∠3 = 62, find m∠1, m∠4, and m∠6.



#13) If m∠3 = 2x + 30 and m∠4 = 3x – 1, find x.



#14) If m∠3 = 4(x + 1) and m∠5 = 2(x + 1), find x.



#15) If WXYZ is a square, find m∠ZXY.

#16) PQMN is a parallelogram. If PN = 7x – 10 and PQ = 5x + 6, for what value of x is PQMN a rhombus?

#17) ABXY is a parallelogram. If AB = 5x + 24 and BX = x^2, for what values of x is ABXY a rhombus?

Determine whether EFGH is a parallelogram, rectangle, rhombus, or square. List all that apply.
#18) E(0, 1), F(2, 0), G(4, 4), H(2, 5)

#19) E(2, -3), F(-3, 1), G(1, 6), H(6, 2)

#1) False, the diagonals of a rhombus are not congruent unless it is a square.
#2) True, the diagonals of a parallelogram bisect each other.
#3) True, the diagonals of a rhombus are perpendicular.
#4) True, since the diagonals of a parallelogram bisect each other, and all four sides of a rhombus are congruent, the triangles are congruent by SSS.
#5) False, the consecutive angles of a rhombus are not congruent unless it is also a square.
#6) True, the consecutive angles in a parallelogram are supplementary.
#7) Rectangle, Square
#8) Parallelogram, Rectangle, Rhombus, Square
#9) Rhombus, Square
#10) Parallelogram, Rectangle, Rhombus, Square
#11) Square #12) $m\angle 1 = 28$, $m\angle 4 = 62$, $m\angle 6 = 90$
#13) 31 #14) 14 #15) 45 #16) 8 #17) -3 and 8
#18) Parallelogram, Rectangle #19) Parallelogram, Rectangle, Rhombus, Square

Trapezoids

Hw Section 6.6

If possible, draw a trapezoid that has the following characteristics. If the trapezoid cant be drawn, explain why.

#1) 3 congruent sides

#2) congruent bases

#3) a leg longer than both bases

#4) bisecting diagonals

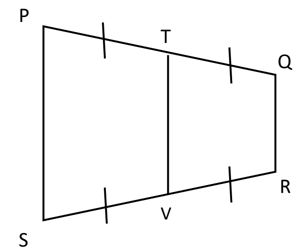
#5) two right angles

#6) four acute angles

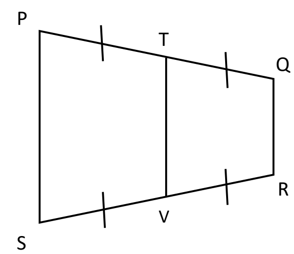
#7) one pair of opposite angles congruent

PQRS is an isoscelees trapezoid with bases $\overline{PS}$ and $\overline{QR}$. Use the figure and the given information to solve each problem.

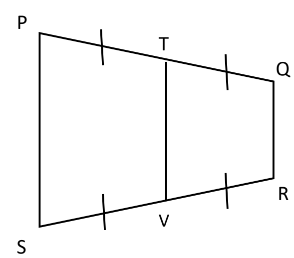
#8) If PS = 20 and QR = 14, find TV.



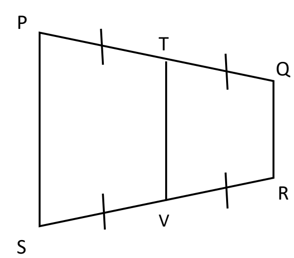
#9) If QR = 14.3 and TV = 23.2, find PS.



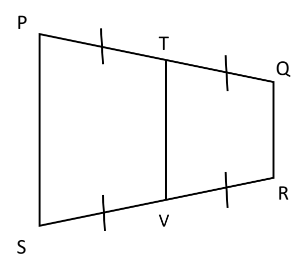
#10) If TV = x + 7 and PS + QR = 5x + 2, find x.



#11) If m∠RVT = 57, find m∠QTV.



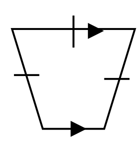
#12) If m∠VTP = x, find m∠TPS in terms of x.



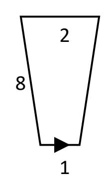
#13) If the measure of the median of an isosceles trapezoid is 4.5, what are the possible integral measures for the bases?

#14) $\overline{UR}$ is the median of a trapezoid TSNO with bases $\overline{ON}$ and $\overline{TS}$. If the coordinates of the points are U(1, 3), R(8, 3), O(0, 0), and N(8, 0), find the coordinates of T and S.

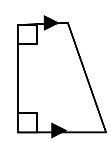
#1)



#3)



#5)



#2) Cannot be drawn
#4) Cannot be drawn: If the diagonals bisected, it would be a parallelogram.
#6) Cannot be drawn: no quadrilateral has four acute angles.
#7) Cannot be drawn: It would be a parallelogram.

#8)	17	#9)	32.1
#10)	4	#11)	57
#12)	180 – x	#13)	1, 8: 2, 7; 3, 6; 4, 5
#14)	T(2, 6), S(8, 6)		

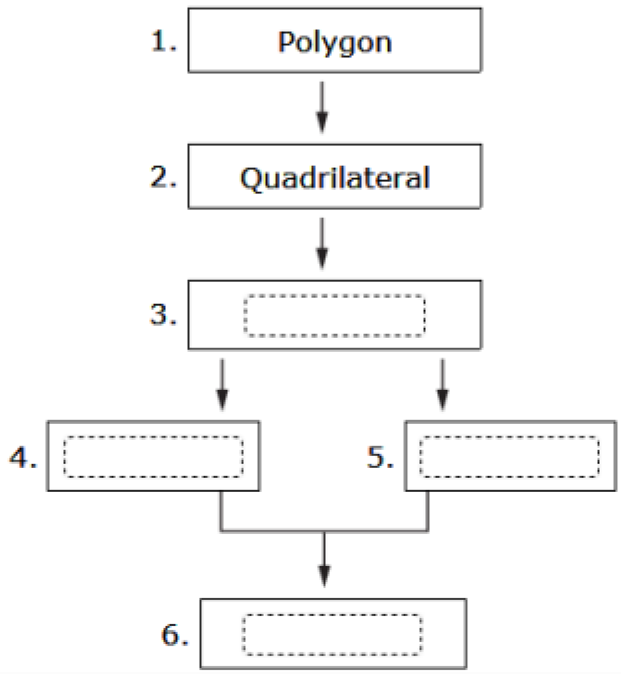
End of Course Test Questions 2019

Question 12

A partially completed chart shows the hierarchy of a set of polygons.

Move a term to each blank box to complete the chart.

Kite | Parallelogram | Rectangle | Rhombus | Square

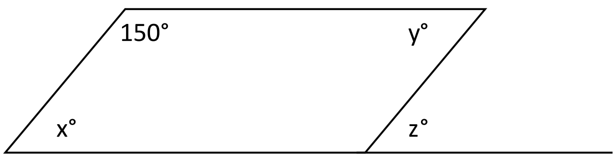


Quadrilaterals

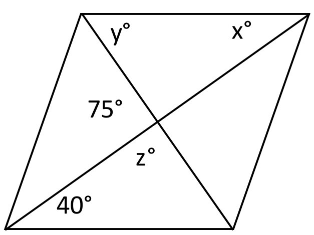
Chapter 6 Review 1

If each quadrilateral is a parallelogram, find the value of x, y, and z.

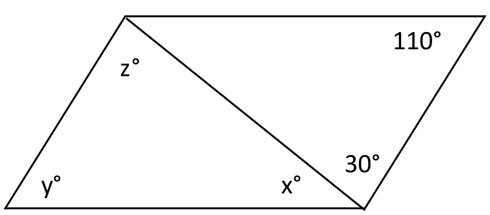
#1)



#2)

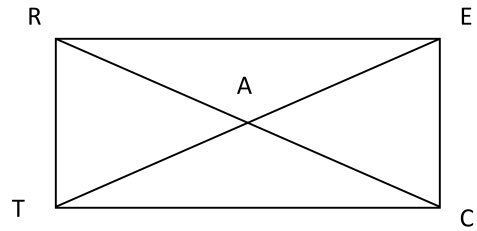


#3)

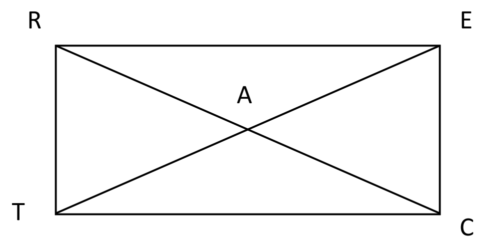


If each quadrilateral is a rectangle, find the value of x.

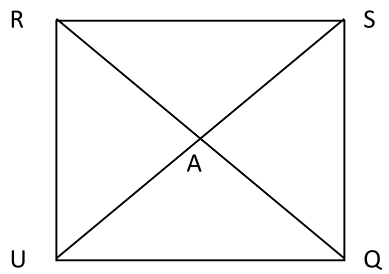
#4) RA = 6x + 7, TE = 37



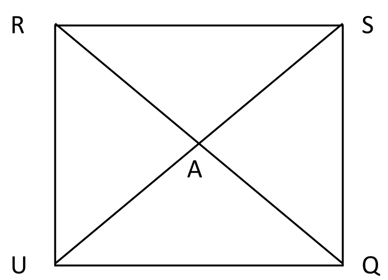
#5) TA = x, AC = 12x - 22



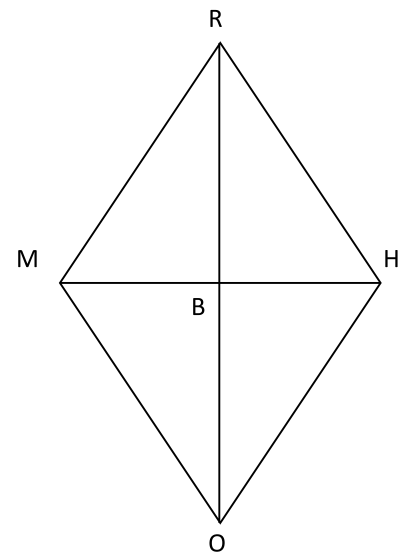
If the quadrilateral is a square, find the value of x and y.
#6) SR = 3x – y, UQ = x + y, RU = 5



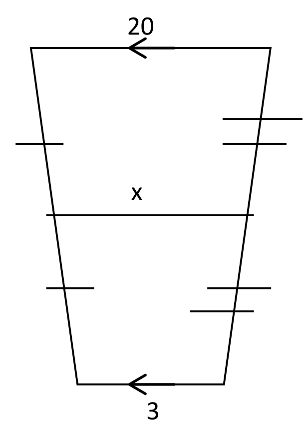
#7) m∠RSA = 11x + y, m∠AQU = 2x + 37y



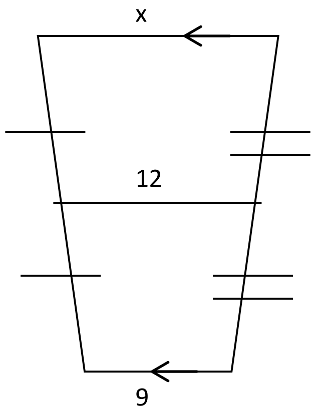
#8) If the quadrilateral is a rhombus, find the value of x and y. m∠RBM = 3x + 3y, m∠RBH = x + 4y



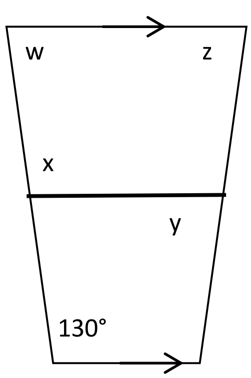
#9) If the quadrilateral is a trapezoid, find the value of x.



#10) If the quadrilateral is a trapezoid, find the value of x.



#11) If the quadrilateral is an isosceles trapezoid with median drawn, find the value of w, x, y, and z.



#12) Given parallelogram PQRS with $m\angle P = y$ and $m\angle Q = 4y + 20$, find the measures of $\angle R$ and $\angle S$.

Diagram

Work

#13) Given rhombus RHOM with RH = 2x + 2 and HO = 5x – 11, find MR.

Diagram

Work

#14) If the measure of the median of an isosceles trapezoid is 6.5, what are the possible integral measures for the bases?

Diagram

Work

#15) $\overline{UR}$ is the median of a trapezoid with bases $\overline{ON}$ and $\overline{TS}$. If the coordinates of the points are U(1, 3), R(6, 3), O(0, 0), and N(8, 0), find the coordinates of T and S.

Diagram

Work

#16) Draw a tree diagram using square, parallelogram, rhombus, quadrilateral, rectangle, polygon, and trapezoid. Your tree should start with the most general term and then gradually get more specific. THIS QUESTION WAS ON THE 2019 END OF COURSE TEST.

Determine whether EFGH is a parallelogram, rectangle, rhombus, or square. List all that apply. Organize your work in a logical manner.

#17) E(0, 1), F(2, 0), G(4, 4), H(2, 5)

Parallelogram Rectangle Rhombus Square

#18) E(2, -3), F(-3, 1), G(1, 6), H(6, 3)

Parallelogram Rectangle Rhombus Square

#19) What is the distance formula?

#20) What is the slope formula?

#21) What is the midpoint formula for the midpoint in a coordinate plane?

#1) x = 30, y = 30, z = 30
#2) x = 40, y = 35, z = 105
#3) x = 40, y = 110, z = 30

#4) $x = \frac{23}{12}$
#5) x = 2

#6) $\left(\frac{5}{2}, \frac{5}{2}\right)$
#7) (4, 1)

#8) (10, 20)

#9) x = 11.5
#10) x = 15

#11) w = 50, x = 130, y = 50, z = 50

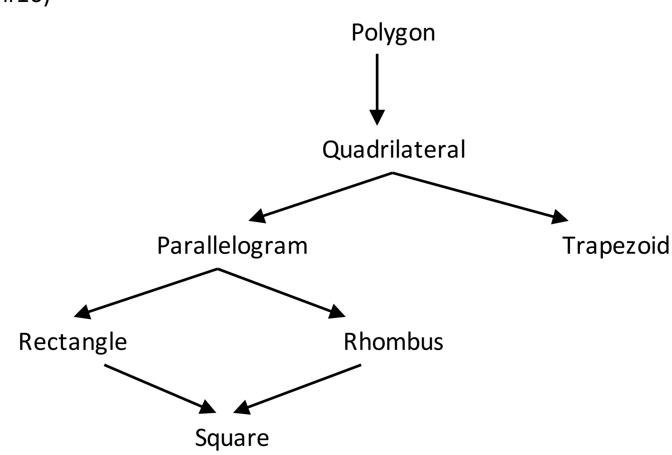
#12) $m\angle R = 32°, m\angle S = 148°$

#13) $MR = \frac{32}{3}$

#14) 1, 12; 2, 11; 3, 10; 4, 9; 5, 8; 6, 7

#15) T(2, 6), S(4, 6)

#16)



#17) Parallelogram and a rectangle.

#18) None

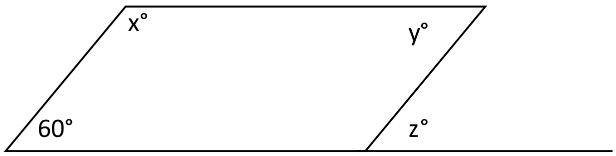
#19), #20), #21) Use your notes. Don't be lazy.

Quadrilaterals

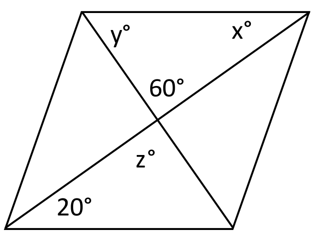
Chapter 6 Review 2

If each quadrilateral is a parallelogram, find the value of x, y, and z.

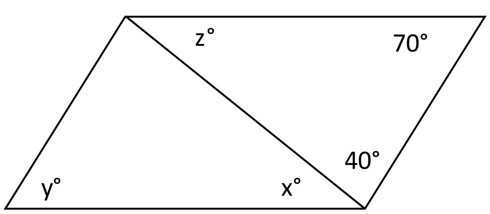
#1)



#2)

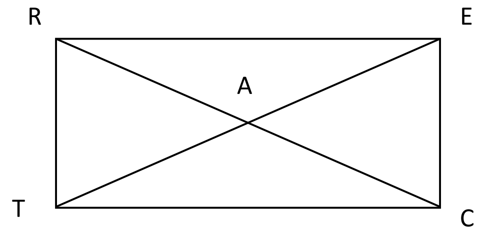


#3)

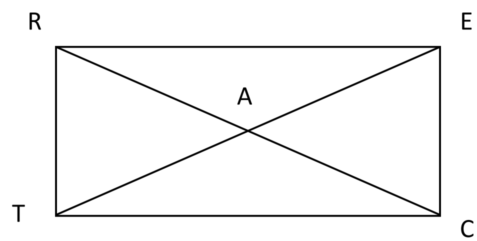


If each quadrilateral is a rectangle, find the value of x.

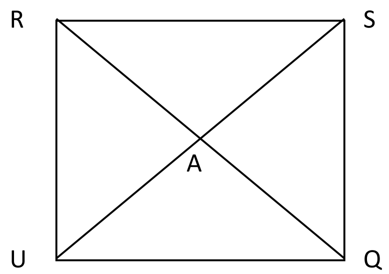
#4) RA = 5x + 2, AE = 32



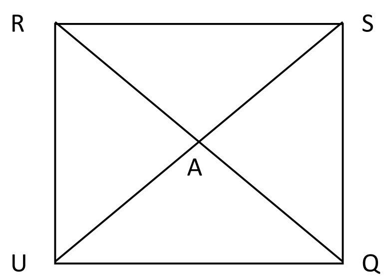
#5) TA = x, RC = 7x - 25



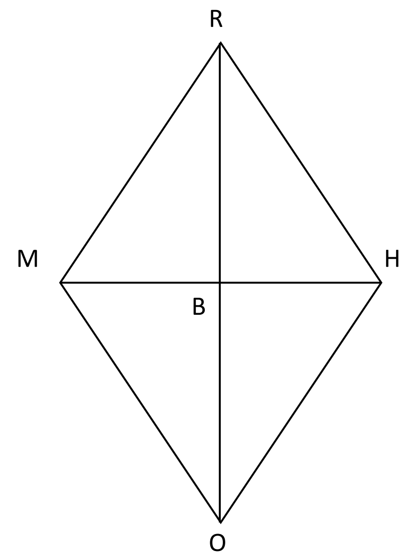
If the quadrilateral is a square, find the value of x and y.
#6) SR = 2x + 2y, UQ = x + 2y + 3, RU = 14



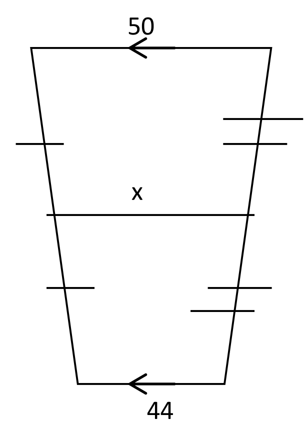
#7) m∠RSA = x + 2y, m∠AQU = 2x + y + 9



#8) If the quadrilateral is a rhombus, find the value of x and y. m∠RBM = 2x + 3y, m∠RBH = 4x + y + 10

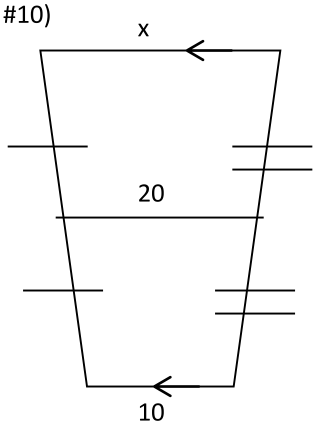


#9) If the quadrilateral is a trapezoid, find the value of x.



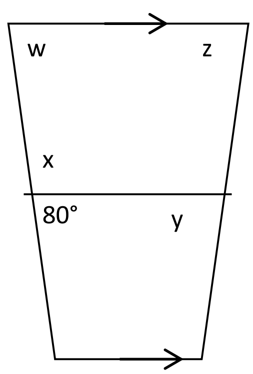
If each quadrilateral is a trapezoid, find the value of x.

#10)



If the quadrilateral is an isosceles trapezoid, find the value of w, x, y, and z.

#11)



#12) Given parallelogram PQRS with m∠P = 16y and m∠Q = 4y – 20, find the measures of ∠R and ∠S.

Diagram

Work

#13) Given rhombus RHOM with RH = 2x + 10 and HO = 9x – 11, find MR.

Diagram

Work

#14) If the measure of the median of an isosceles trapezoid is 3.5, what are the possible integral measures for the bases?

Diagram

Work

#15) $\overline{UR}$ is the median of a trapezoid with bases $\overline{ON}$ and $\overline{TS}$. If the coordinates of the points are U(3, 4), R(9, 4), O(0, 0), and N(10, 0), find the coordinates of T and S.

Diagram

Work

#16) Draw a tree diagram using square, parallelogram, rhombus, quadrilateral, rectangle, polygon, and trapezoid. Your tree should start with the most general term and then gradually get more specific. THIS QUESTION WAS ON THE 2019 END OF COURSE TEST.

Determine whether EFGH is a parallelogram, rectangle, rhombus, or square. List all that apply. Organize your work in a logical manner.

#17) E(6, 5), F(2, 3), G(-2, 5), H(2, 7)

Parallelogram Rectangle Rhombus Square

#18) E(2, -3), F(-3, 1), G(1, 6), H(6, 2)

Parallelogram Rectangle Rhombus Square

#19) What is the distance formula?

#20) What is the slope formula?

#21) What is the midpoint formula for the midpoint in a coordinate plane?

Properties of Proportions

Hw Section 7.1

Gears on bicycles are called sprocket wheels. To determine gear ratios on bicycles, you must find the ratio of the number of rear sprocket teeth to the number of front sprocket teeth. Find each ratio. Express your answer as a decimal rounded to the nearest hundredth.

#1) 12 rear sprocket teeth
24 front sprocket teeth

#2) 15 rear sprocket teeth
55 front sprocket teeth

#3) 13 rear sprocket teeth
52 front sprocket teeth

#4) 20 rear sprocket teeth
30 front sprocket teeth

Solve each proportion. Do not round answers.

#5) $\frac{11}{24} = \frac{x}{24}$

#6) $\frac{5}{8} = \frac{20}{x}$

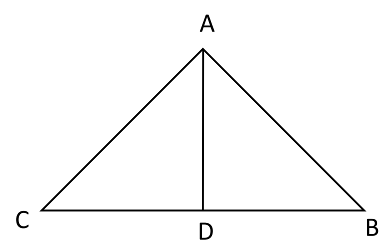
#7) $\frac{x}{3.24} = \frac{1}{8}$

#8) $\frac{4}{x} = \frac{7}{8}$

#9) $\frac{x+3}{12} = \frac{5}{4}$

#10) $\frac{1}{3} = \frac{x}{8-x}$

$\overline{AD}$ is a median of ΔABC. Use the picture below for #11 - #13.



#11) Find the ratio of BD to DC.

#12) Find the ratio of DC to BC.

#13) If ΔABC is an equilateral triangle, find the ratio of m∠ABD to m∠ADC.

Proportions can be used to change a fraction to a percent. For example, to change $\frac{5}{6}$ to a percent, you divide 5 by 6, then shift the decimal two places to the right. Change each fraction to a percent using long division. (No calculators.) Round final answer to the nearest tenth.

#14) $\frac{3}{8}$

#15) $\frac{5}{12}$

#16) $\frac{13}{4}$

#17) The ratio of the measures of two angles of an isosceles triangle is 1 to 2. What are the possible measures of the angles of the triangle?

#18) One way to determine the strength of a bank is to calculate its capital-to-assets ratio as a percent. A strong bank should have a ratio of 4% or more. The Pilgrim National Bank has a capital of 2.3 billion dollars and assets of 52.6 billion dollars. Is it a strong bank? Explain.

#19) On a bike, the ratio of the number of rear sprocket teeth to the number of front sprocket teeth is equivalent to the number of rear sprocket wheel revolutions to the number of pedal revolutions. If there are 24 rear sprocket teeth and 54 front sprocket teeth, how many revolutions of the rear sprocket wheel will occur for 3 revolutions of the pedal? Round to the nearest tenth.

#1)	0.50	#2)	0.27	#3)	0.25
#4)	0.67	#5)	11	#6)	32
#7)	0.405	#8)	$\frac{32}{7}$	#9)	12
#10)	2	#11)	$\frac{1}{1}$	#12)	$\frac{1}{2}$
#13)	$\frac{2}{3}$	#14)	37.5%	#15)	41.7%
#16)	325%	#17)	36, 72, 72 or 45, 45, 90		

#18) Yes, because their capital-to-assets ratio is 4.4% which is greater than 4%.
#19) About 1.3

Similar Polygons

Hw Section 7.2

Draw the following. Mark the congruent angles.

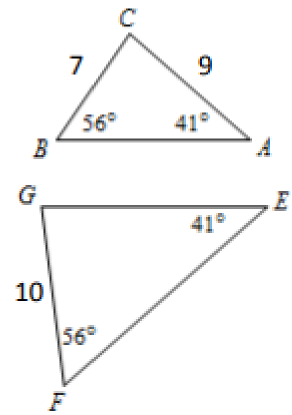
#1) $\Delta CAT \sim \Delta DOG$

#2) Parallelograms $DORK \sim FACE$

#3) Trapezoids $BACK \sim HAIR$

The following triangles are similar. Fill in the blank using the proper order. Find the scale factor.

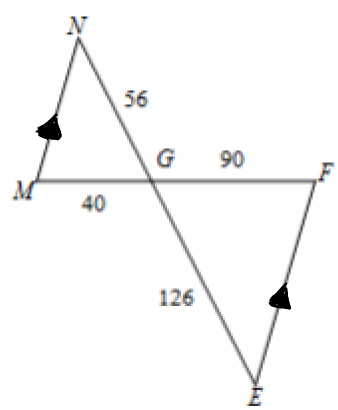
#4)



$\Delta EFG \sim$ _______

Scale Factor =

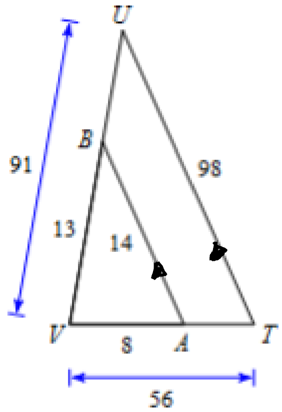
#5)



$\Delta GFE \sim$ _______

Scale Factor =

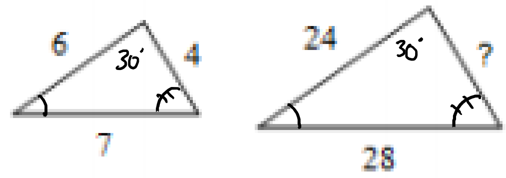
#6)



$\Delta VUT \sim$ ______

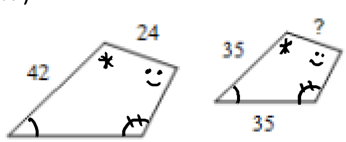
Scale Factor =

#8)

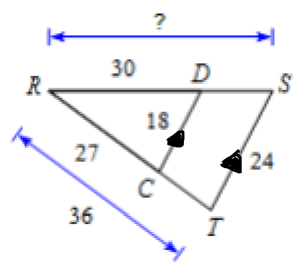


Each pair of polygons are similar. Find the missing length.

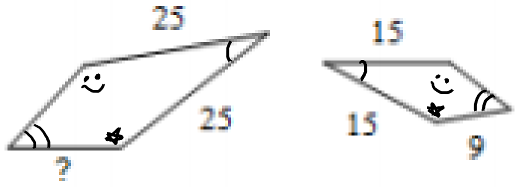
#7)



#9)

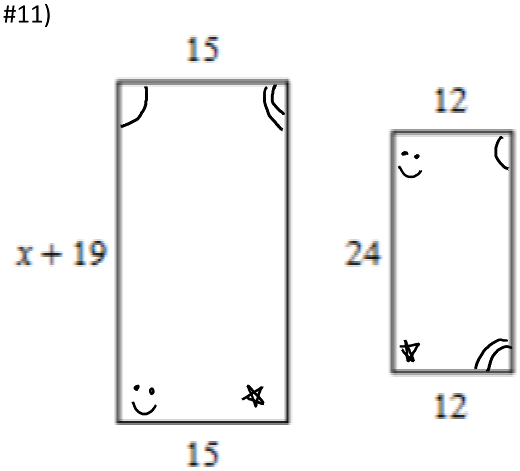


#10)

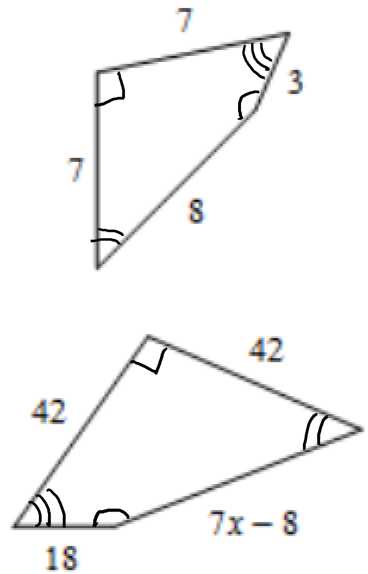


The following polygons are similar. Find the value of x.

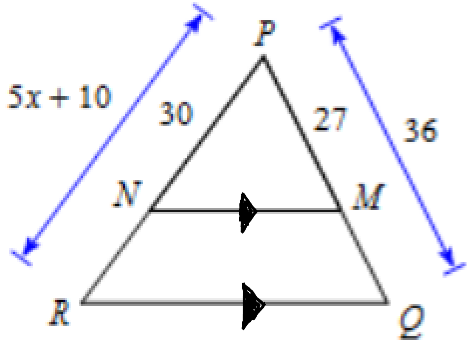
#11)



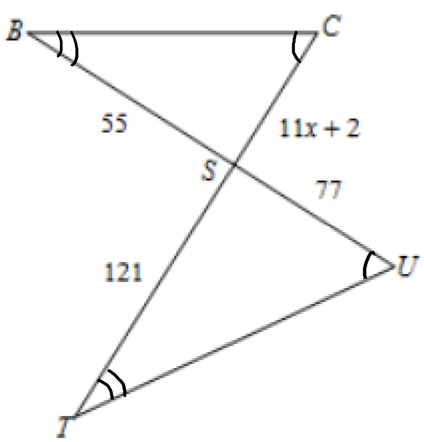
#12)



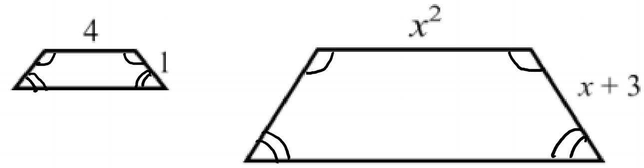
#13)



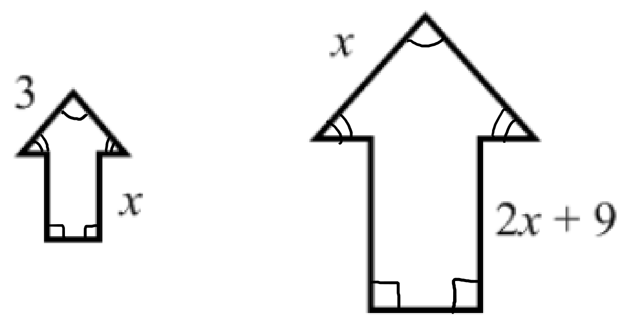
#14)



#15)



#16)



Similar Triangles

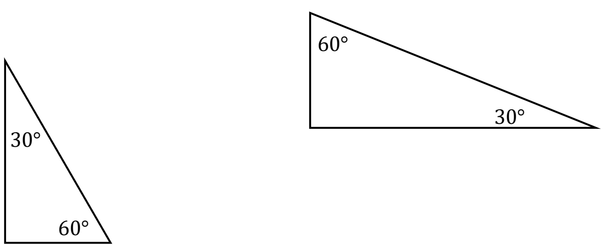
Hw Section 7.3

#1) Write down the definition of similar polygons.

#2) Write down the definition of congruent polygons.

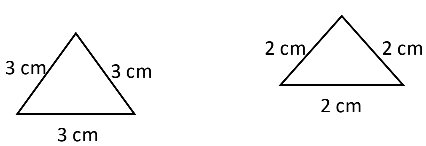
Determine whether each pair of triangles is similar using the given information. If similar, explain.

#3)

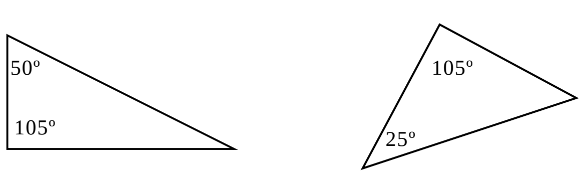


#4)

#5)

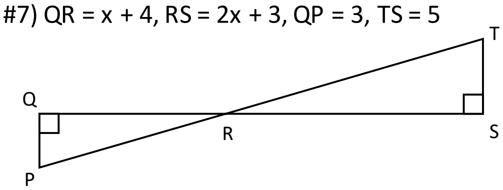


#6)

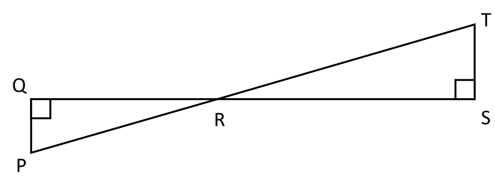


Find the value of x.

#7) QR = x + 4, RS = 2x + 3, QP = 3, TS = 5

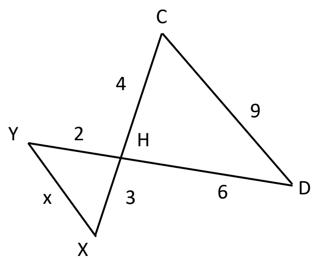


#8) QR = 3x – 4, RS = x + 1, QP = 4, TS = 6

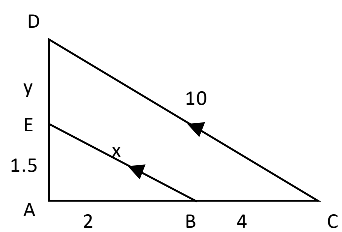


Determine if each pair of triangles is similar. If similar, state the reason and find the missing measures.

#9)

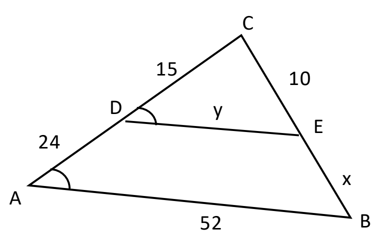


#10)

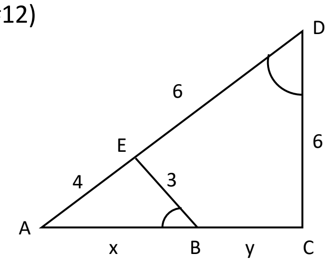


Identify the similar triangles in each figure. Explain why they are similar and find the missing measures of x and y.

#11)



#12)



Draw a picture, make a proportion & answer the question.

#13) A 10-foot tree casts a 3 foot shadow. How tall is a tree that casts a 22-foot shadow at the same time of day? Round to one decimal place.

#3) Yes by AA similarity
#4) No (corresponding sides are not proportional)
#5) Yes by SSS similarity #6) Yes by AA similarity
#7) x = 11 #8) x = 2
#9) Yes, SAS similarity. x = 4.5 or $\frac{9}{2}$
#10) Yes, AA similarity. $\left(\frac{10}{3}, 3\right)$
#11) ΔABC is similar to ΔDEC, by AA Similarity, (16, 20)
#12) ΔABE is similar to ΔADC, by AA Similarity, (5, 3)
#13) 73.3’

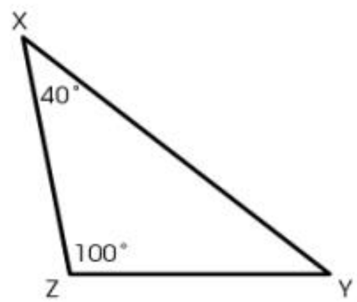
Similar Triangles

Hw Section 7.3B

End of Course Test Questions

Question 3

Triangle XYZ is shown.

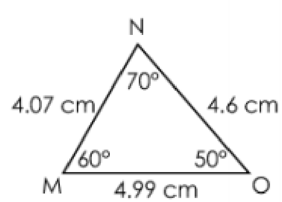


Which triangle must be similar to triangle XYZ?

- (A) a triangle with two angles that measure 40°
- (B) a triangle with angles that measure 40° and 60°
- (C) a scalene triangle with only one angle that measures 100°
- (D) an isosceles triangle with only one angle that measures 40°

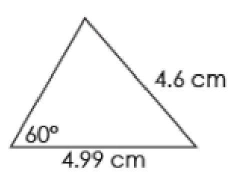
Question 34

Triangle MNO is shown.

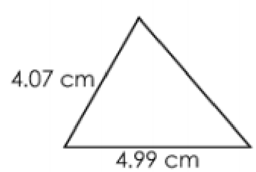


Which triangle can be shown to be congruent to triangle MNO with only the given information?

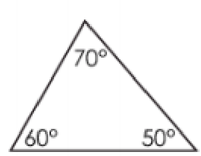
(A)



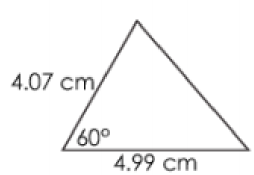
(C)



(B)

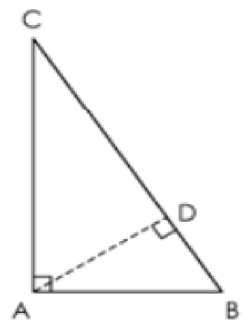


(D)



Question 17

James correctly proves the similarity of triangles DAC and DBA as shown.



His incomplete proof is shown.

	Statements		Reasons
1.	$m\angle CAB = m\angle ADB = 90°$	1.	Given
2.	$m\angle ADB + m\angle ADC = 180°$	2.	Angles in a linear pair are supplementary.
3.	$90° + m\angle ADC = 180°$	3.	Substitution
4.	$m\angle ADC = 90°$	4.	Subtraction property of equality
5.	$\angle CAB \cong \angle ADB$ $\angle CAB \cong \angle ADC$	5.	Definition of congruent angles
6.	$\angle ABC \cong \angle DBA$ $\angle DCA \cong \angle ACB$	6.	Reflexive property of congruence
7.	$\triangle ABC \sim \triangle DBA$ $\triangle ABC \sim \triangle DAC$	7.	?
8.	$\triangle DBA \sim \triangle DAC$	8.	Substitution

What is the missing reason for the seventh statement?

Ⓐ CPCTC

Ⓑ AA postulate

Ⓒ All right triangles are similar.

Ⓓ Transitive property of similarity

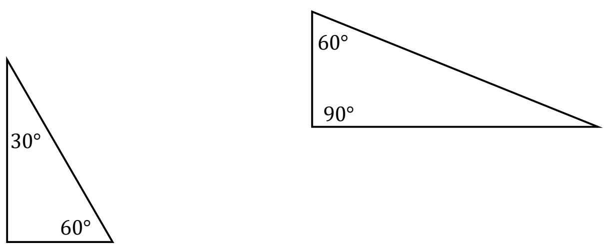
Similar Triangles Hw Section 7.3B continued

#1) Write down the definition of similar polygons.

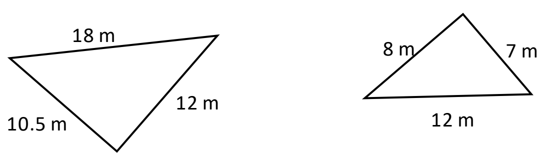
#2) Write down the definition of congruent polygons.

Determine whether each pair of triangles is similar using the given information. If similar, explain.

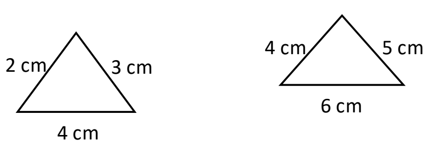
#3)



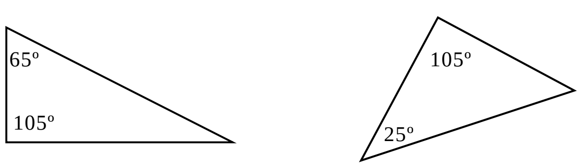
#4)



#5)

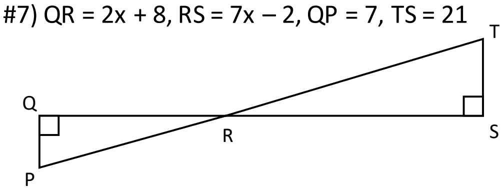


#6)

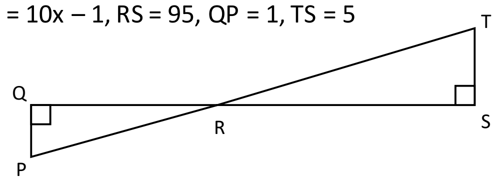


Find the value of x.

#7) QR = 2x + 8, RS = 7x – 2, QP = 7, TS = 21

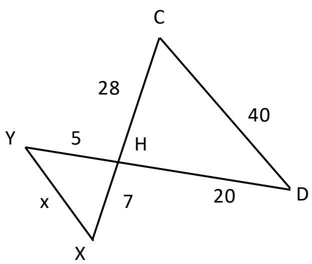


#8) QR = 10x – 1, RS = 95, QP = 1, TS = 5

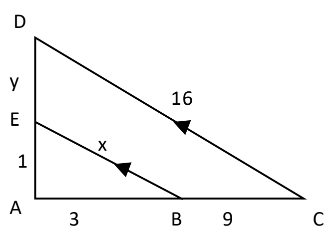


Determine if each pair of triangles is similar. If similar, state the reason and find the missing measures.

#9)

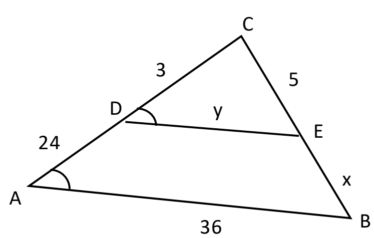


#10)

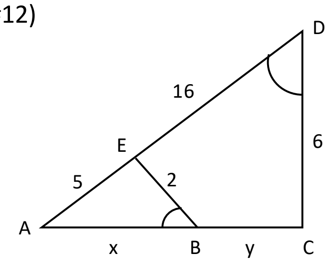


Identify the similar triangles in each figure. Explain why they are similar and find the missing measures of x and y.

#11)



#12)



Draw a picture, make a proportion & answer the question.

#13) A Ford Mustang is 15 feet long. Jimmy wants to make a model of the car using 2 feet to 7 inch scale. How long is the model? Round to one decimal place.

#3) Yes by AA similarity #4) Yes, SSS similarity.
#5) No, (corresponding sides are not proportional)
#6) No, (corresponding angles are not congruent)
#7) x = 26 #8) x = 2
#9) Yes, SAS similarity. x = 10
#10) Yes, AA similarity. (4, 3)
#11) ΔABC is similar to ΔDEC, by AA Similarity, (40, 4)
#12) ΔABE is similar to ΔADC, by AA Similarity, (7, 8)
#13) 52.5”

Similarity

Review 7.1 – 7.3

#1) Define ratio.

#2) Define proportion.

Solve each proportion

#3) $\frac{x}{12} = \frac{8}{30}$

#4) $\frac{10}{9} = \frac{30}{x+2}$

#5) The ratio of the measures of the angles of a triangle is 3:5:7. What is the measure of each angle in the triangle?

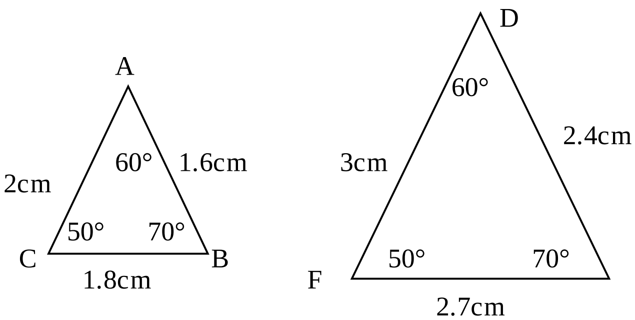
#6) On a map of Ohio, three fourths of an inch represents 15 miles. If it is approximately 10 inches from Sandusky to Cambridge on the map, what is the actual distance in miles?

#7) Define scale factor.

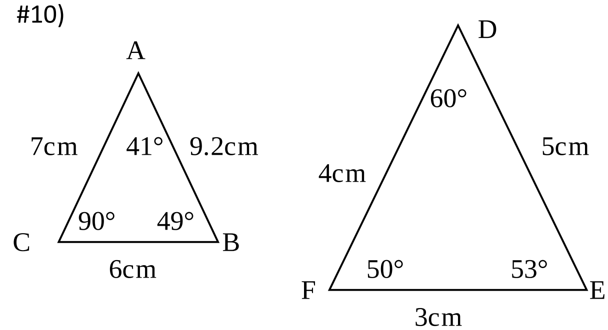
#8) Define similar polygons.

Determine if each pair of polygons is similar by using the definition of similar. Justify your answer.

#9)

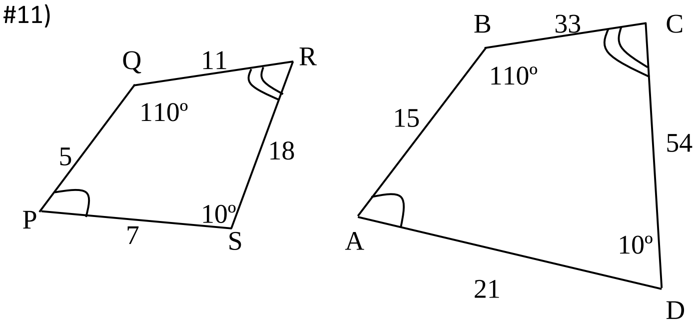


#10)



If quadrilateral PQRS is similar to ABCD, find the scale factor of quadrilateral PQRS to quadrilateral ABCD.

#11)

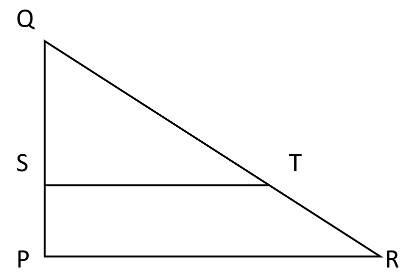


#12) State the AA Similarity

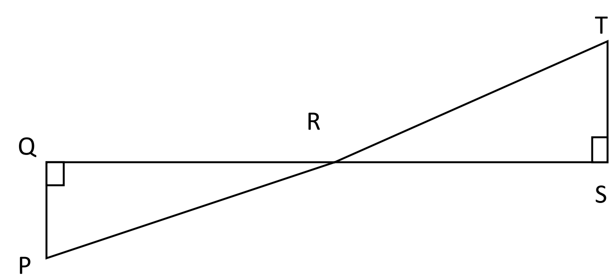
#13) State the SSS Similarity:

#14) State the SAS Similarity:

#15) In the figure, $\overline{ST} // \overline{PR}$, QS = 3, SP = 1, and TR = 1.2. Find QT.



#16) If TS = 6, QP = 4, RS = x + 1, and QR = 3x – 4, find the value of x



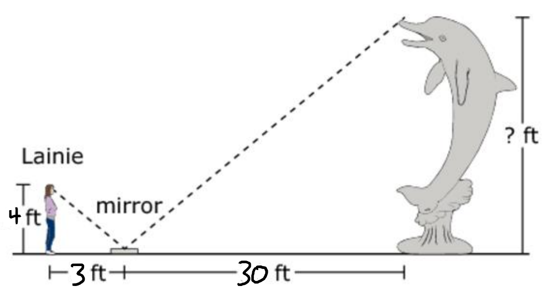
#17)______Jose performs a transformation on a triangle. The resulting is similar but not congruent to the original triangle. Which transformation did Jose use?

A) Dilation
B) Reflection
C) Rotation
D) Translation

#18) A study reports that in 2000 the population of the United States was 282,054,422 people and the land area was approximately 3,531,905 square miles.

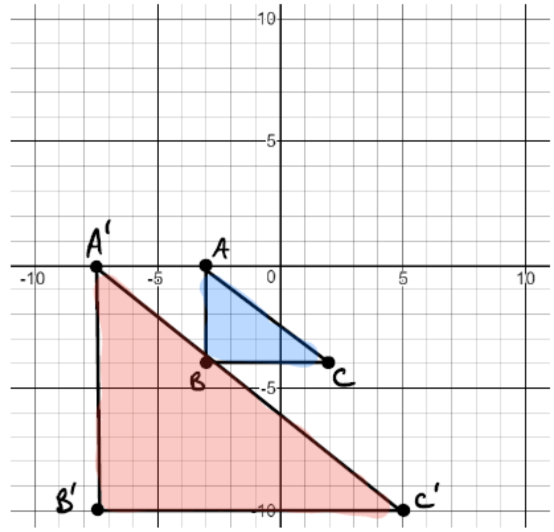
Based on the study, what was the population density, in people per square mile, of the United States in 2000? Round your answer to the nearest tenth.

#19) Lainie wants to calculate the height of the sculpture. She places a mirror on the ground so that when she looks into the mirror she sees the top of the sculpture, as shown.



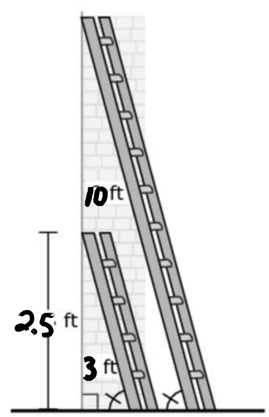
What is the height, in feet, of the sculpture?

#20) Triangle ABC is dilated with a scale factor of k and a center of dilation at the origin to obtain triangle A'B'C'.



What is the scale factor?

#21) A 10-foot ladder and a 3-foot ladder are leaning against a house. The two ladders create angles of the same measure with the ground. The 3-foot ladder has a height of 2.5 feet against the house.

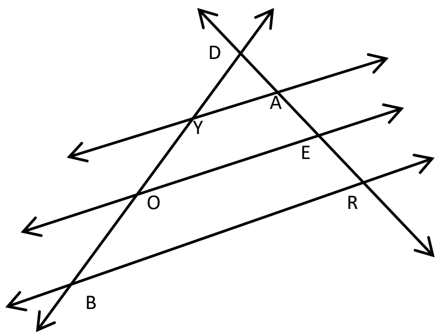


What is the height, in feet, of the 10-foot ladder against the house?

Parallel Lines & Proportional Parts

Hw Section 7.4

In the figure, $\overleftrightarrow{YA} \parallel \overleftrightarrow{OE} \parallel \overleftrightarrow{BR}$. Complete each statement.



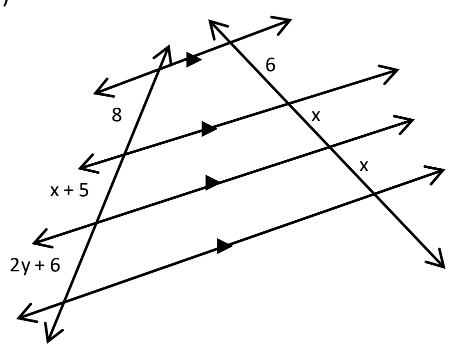
#1) $\frac{YO}{OB} = \frac{AE}{\_\_\_\_}$ #2) $\frac{YB}{OB} = \frac{\_\_\_\_}{ER}$

#3) $\frac{\_\_\_\_}{AE} = \frac{YB}{YO}$ #4) $\frac{DY}{YO} = \frac{DA}{\_\_\_\_}$

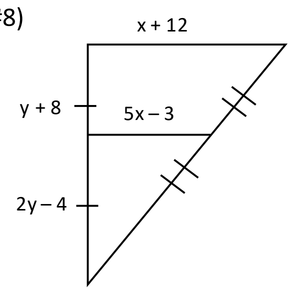
#5) $\frac{DR}{\_\_\_\_} = \frac{DB}{YB}$ #6) $\frac{\_\_\_\_}{AE} = \frac{DO}{YO}$

Find the value of x and y.

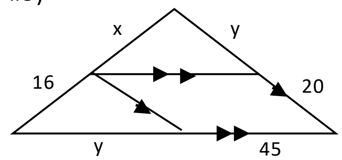
#7)



#8)

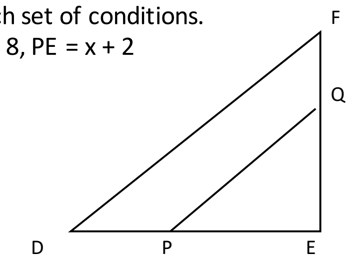


#9)

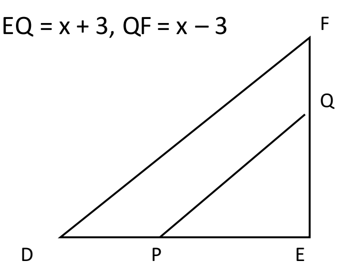


Using the figure, determine the value of x that would make $\overline{PQ} \parallel \overline{DF}$ under each set of conditions.

#10) EQ = 3, DP = 12, QF = 8, PE = x + 2

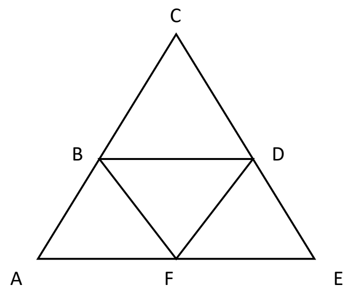


#11) DE = 12, PE = 7, EQ = x + 3, QF = x – 3

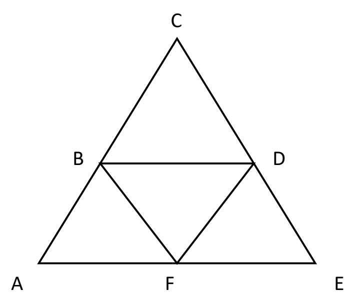


Using the figure, determine the value of x under each set of conditons.

#12) $\overline{BD} // \overline{AE}$, AB = 6, DE = 8, DC = 4, BC = x



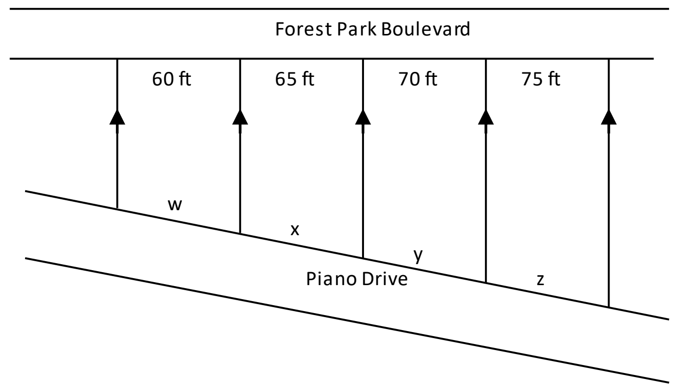
#13) $\overline{AC} // \overline{DF}$, DC = 7, DE = 5, FA = 8, FE = x



#14) If B, D, and F are the midpoints of sides $\overline{CA}$, $\overline{CE}$, and $\overline{AE}$ respectively, BD = 7, BF = 12, and DF = 16, find the perimeter of ΔACE. What is the ratio of the perimeter of ΔBDF to the perimeter of ΔAEC?

#15) If B, D, and F are the midpoints of sides $\overline{CA}$, $\overline{CE}$, and $\overline{AE}$ respectively in ΔACE, BD = 8, CA = 10, and DE = 4, find DF, AE, and BF.

#16) In Forest Park, the home lots are laid out as shown. What is the individual frontage of each lot on Piano Drive if the total frontage on the drive for the five lots is known to be 350feet?



#1) ER	#2) AR	#3) AR
#4) AE	#5) AR	#6) DE
#7) (15, 7)	#8) (2, 12)	#9) (24, 30)
#10) 2.5	#11) 18	#12) 3
#13) $\frac{40}{7}$	#14) Perimeter ΔAEC = 70, $\frac{Perimeter\ \Delta BDF}{Perimeter\ \Delta AEC} = \frac{1}{2}$	

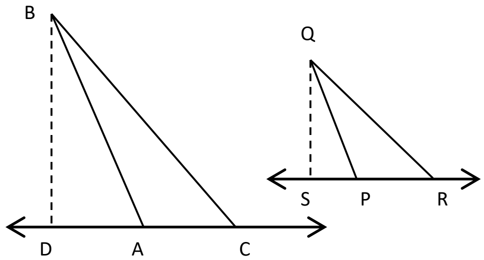
#15) DF = 5, AE = 16, BF = 4

#16) w ≈ 77.8 ft, x ≈ 84.3 ft, y ≈ 90.7 ft, z ≈ 97.2

Parts of Similar Triangles

Hw Section 7.5

In the figure $\triangle ABC \sim \triangle PQR$, $\overline{BD}$ is an altitude of $\triangle ABC$, and $\overline{QS}$ is an altitude of $\triangle PQR$. Determine whether each statement is true or false.



#1) $\frac{BD}{QS} = \frac{AB}{PQ}$

#2) $\frac{AD}{PS} = \frac{QR}{BC}$

#3) $\frac{QP}{AB} = \frac{BD}{QS}$

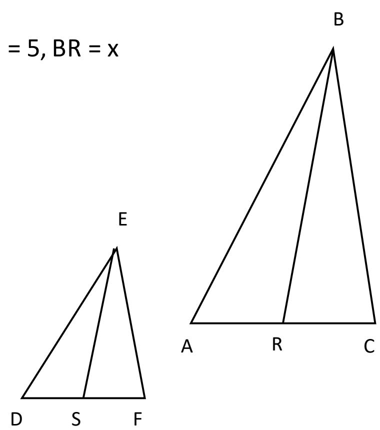
#4) $\frac{QR}{BC} = \frac{QS}{BD}$

#5) $\frac{BD}{QS} = \frac{AC}{PR}$

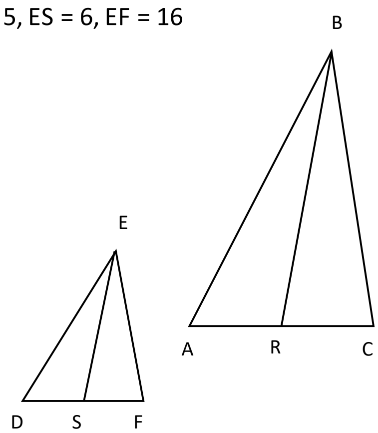
#6) $\frac{AB}{BD} = \frac{PQ}{QS}$

Using the figure, $\triangle ABC \sim \triangle DEF$, $\overline{AR} \cong \overline{RC}$ and $\overline{DS} \cong \overline{SF}$.
Find the value of x.

#7) AC = 20, DF = 12, ES = 5, BR = x

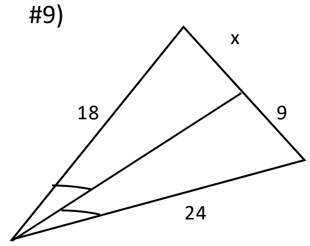


#8) BC = x + 2, BR = x – 5, ES = 6, EF = 16

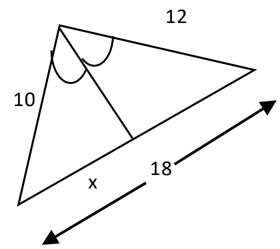


Find the value of x.

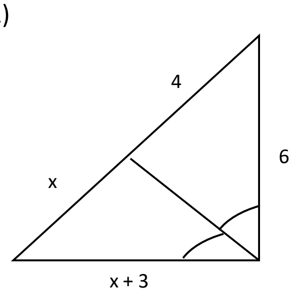
#9)



#10)

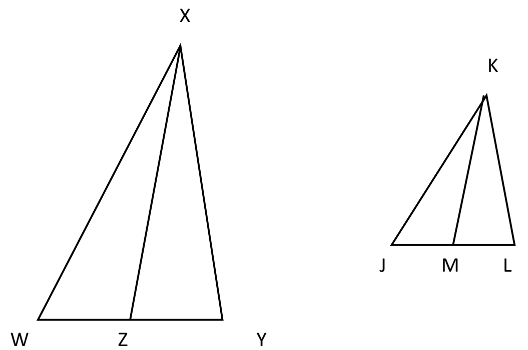


#11)

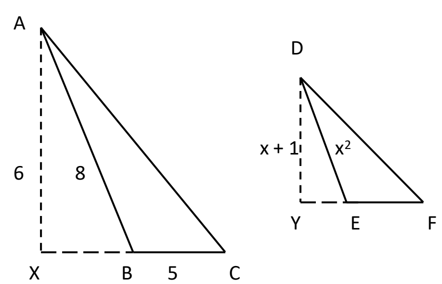


Using the figure, determine the value of x under each set of conditons.

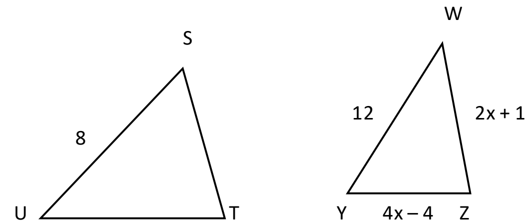
#12) In the figure, $\Delta WXY \sim \Delta JKL$, $\overline{XZ}$ and $\overline{KM}$ are medians. If XZ = 4, WZ = 3, JL = x + 2, and KM = 2x – 5, find JM.



#13) In the figure, $\Delta ABC \sim \Delta DEF$, $\overline{AX}$ and $\overline{DY}$ are altitudes. Find DY.



#14) In the figure, $\Delta STU \sim \Delta WZY$. If the perimeter of ΔSTU is 30 units, find the value of x.



#15) Lenny is having his senior portrait taken. Suppose Lenny is 300 cm from a camera lens and the film is 1.3 cm from the lens. If Lenny is 180 cm tall, how tall is his image on the film?

#1) True	#2) False	#3) False
#4) True	#5) True	#6) True
#7) $\frac{25}{3}$	#8) $\frac{46}{5} = 9.2$	#9) $\frac{27}{4} = 6.75$
#10) $\frac{90}{11}$	#11) 6	#12) $\frac{27}{8}$
#13) $\frac{1}{3}$ $or\ 3$	#14) 6	#15) $\frac{39}{50} = 0.78\ cm$

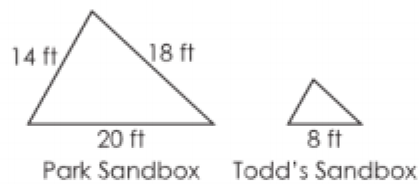
End of Course Released Question

2019

Question 49

A park has a triangular sandbox. Todd wants to create a smaller sandbox at his backyard having the same angles as the park sandbox.

Drawings of both sandboxes are shown.



What is the perimeter, in feet (ft), of Todd's sandbox?

Similarity

Chapter 7 Review

Answer true or false. If false, tell why in the margin after the problem.

#1) A ratio is a comparison of two numbers.

#2) Cross products are another name for cross multiply.

#3) The golden ratio was used by Egyptians and is the ratio 1:1.618.

#4) If two angles of one triangle are congruent to two angles of another triangle, then the triangles are congruent.

#5) Similarity of triangles is reflexive, symmetric, and transitive.

#6) An altitude of a triangle goes through a vertex and is perpendicular to the side opposite that vertex.

#7) Perimeter is the distance around an object.

#8) A proportion is an equation stating that two ratios are equal.

#9) If triangle ABC is similar to triangle EFG, then $\frac{AB}{EF} = \frac{BC}{EG}$

#10) An equilateral triangle always has 60° angles.

Multiple choice. Choose the best answer.

#11) Which of the following proportions is true if quadrilateral ABCD is similar to quadrilateral EFGH?

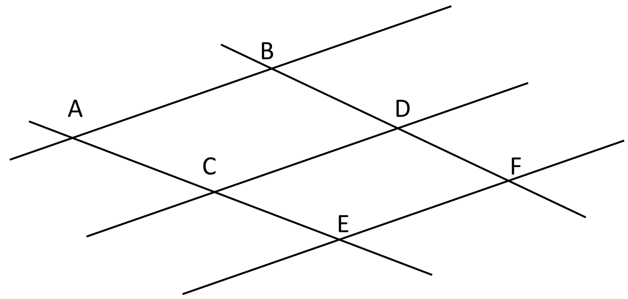
A) $\frac{AB}{DC} = \frac{HG}{EF}$

B) $\frac{AD}{DC} = \frac{HE}{FG}$

C) $\frac{BC}{DC} = \frac{FG}{HG}$

D) $\frac{17}{19} = \frac{3}{4}$

#12) Which of the following is NOT true given that $\overline{AB} \parallel \overline{CD} \parallel \overline{EF}$?



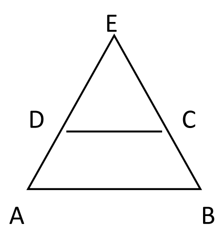
A) $\frac{AC}{BD} = \frac{CE}{DF}$

B) $\frac{AE}{BF} = \frac{CE}{DF}$

C) $\frac{AC}{BD} = \frac{DF}{CE}$

D) $\overline{AB} // \overline{EF}$

#13) Which of the following is a true conclusion given that $\overline{AB} \parallel \overline{DC}$?



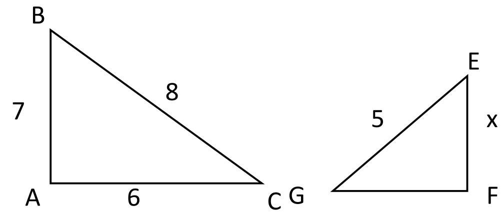
A) 2DC = AB

B) DC = ½AB

C) $\frac{DC}{AB} = \frac{AB}{DC}$

D) $\frac{ED}{EC} = \frac{DA}{CB}$

#14) If ΔABC is similar to ΔEFG, find x.



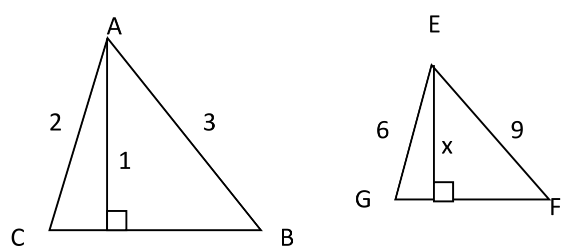
A) $\frac{35}{6}$

B) $\frac{40}{7}$

C) $\frac{35}{8}$

D) No solution.

#15) If triangle ABC is similar to triangle EFG, find x.



A) $\frac{1}{3}$

B) 3

C) $\frac{9}{2}$

D) $\frac{2}{9}$

Short answer. Use complete sentences. A definition covers all situations. An example is a specific situation.

#16) Define similar polygons. Also, give an example of similar polygons.

Definition

Example:

#17) Define congruent polygons. Also, give an example of congruent polygons.

Definition

Example:

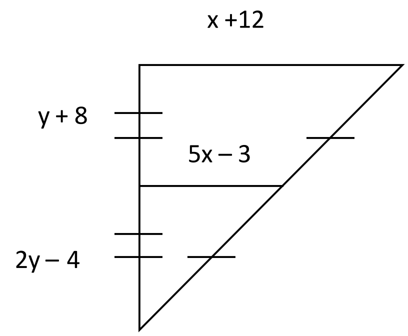
#18) Define scale factor. Also, give an example of a scale factor.
Definition

Example:

#19) Define SSS similarity. Also, give an example of SSS similarity.
Definition

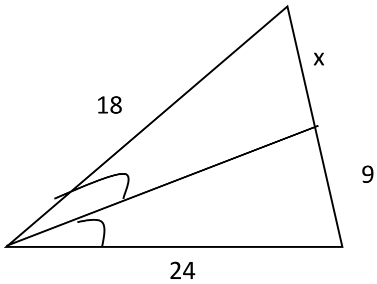
Example:

#20) Find the value of x and y.



#21) If B, D, and F are midpoints of sides $\overline{CA}$, $\overline{CE}$, and $\overline{AE}$ respectively, BD = 6, BF = 12, and DF = 15, find the perimeter of ΔAEC. Also, label the lengths of each segment in your drawing.

#22) Find the value of x.



#24) The pitch of a roof is the ratio of the rise to the run. If a roof has a rise of 2.5 feet and a run of 13.5 feet, what is its pitch?

#23) Find all values of x.

$$\frac{x+1}{7} = \frac{8}{x}$$

#25) While chilling in the attic, Anne Frank is making a rectangular clay plaque 25 inches wide and 36 inches long. The plaque shrinks uniformly in the kiln to a 30-inch length. What is the width after the plaque shrinks?

Transformations – Isometries

Hw T.1 ***(G.CO.A.2)***

1. Circle which of the following are isometric transformations? (there may be more than 1 answer) And determine which transformation took place by writing reflection, translation, rotation, dilation, stretch or other under each image.

Pre-Image

Image A

____

Image B

____

Image C

____

2. Circle which of the following are isometric transformations? (there may be more than 1 answer) And determine which transformation took place by writing reflection, translation, rotation, dilation, stretch or other under each image.

Pre-Image

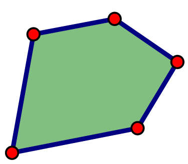
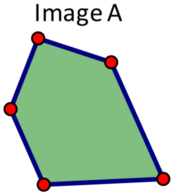
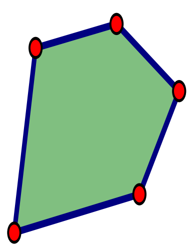


Image A



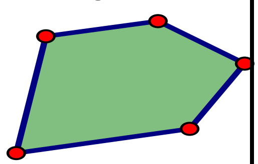
____

Image B



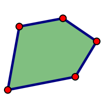
____

Image C



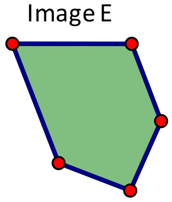
____

Image D



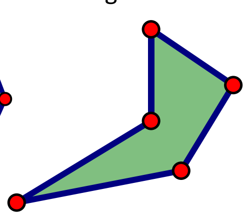
____

Image E



____

Image F



____

3. Jane claims that any two circles are always isometric because the shape never changes. Is she correct?

   YES or NO Explain your answer.

4. Determine if the pre-image and image are isometric and also write down which transformation (rotation, reflection, translation, dilation, stretch, or other) produced the image.

Preimage

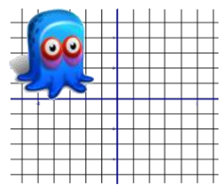


Image A

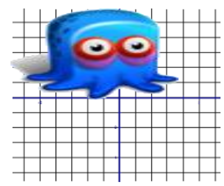


Image B

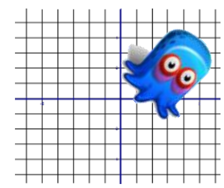


Image C

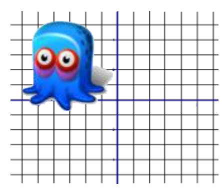


Image D

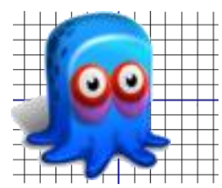
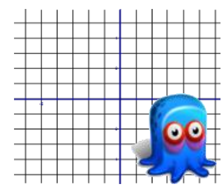


Image E



5. Determine if the pre-image and image are isometric and also write down which transformation (rotation, reflection, translation, dilation, stretch, or other) produced the image.

Preimage

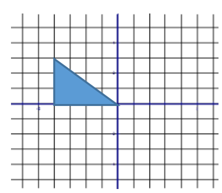


Image A

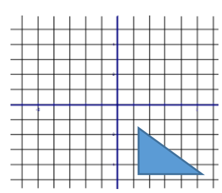


Image B

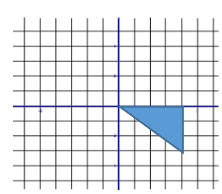


Image C

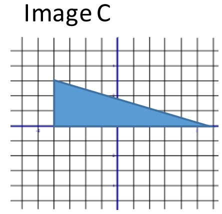


Image D

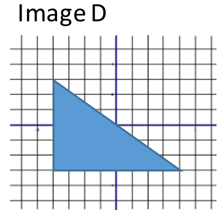
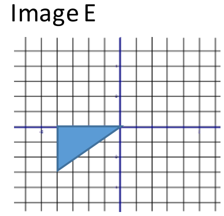
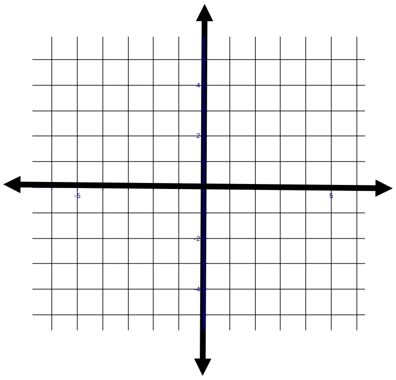


Image E

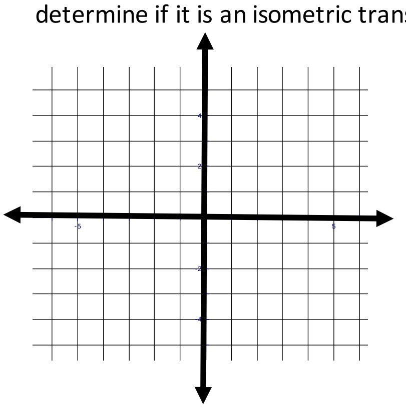


6. Plot the preimage triangle. Determine the coordinates of the image, plot the image and determine if it is an isometric transformation.



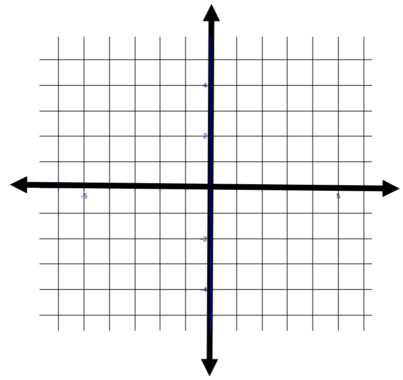
	Transformation
a) Pre-Image Points **A (1,-4)** **B (2,-1)** **C (6,-4)** Isometry? Yes or No Transformation Type:	Coordinate Rule **(x,y) → (x – 5, y + 3)** Image Points A' (_____,_____) B' (_____,_____) C' (_____,_____)

7. Plot the preimage triangle. Determine the coordinates of the image, plot the image and determine if it is an isometric transformation.



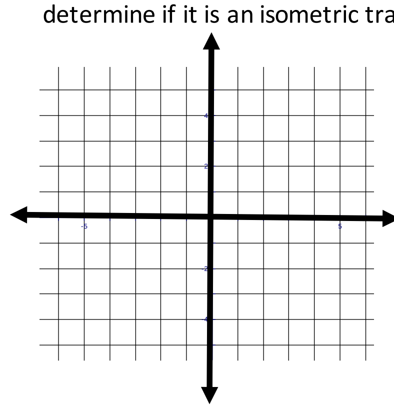
	Transformation
a) Pre-Image Points **A (1,-4)** **B (2,-1)** **C (6,-4)** Isometry? Yes or No Transformation Type:	Coordinate Rule **(x,y) → (y, -x)** Image Points A' (_____,_____) B' (_____,_____) C' (_____,_____)

8. Plot the preimage triangle. Determine the coordinates of the image, plot the image and determine if it is an isometric transformation.



	Transformation
a) Pre-Image Points **A (1,-4)** **B (2,-1)** **C (6,-4)** Isometry? Yes or No Transformation Type:	Coordinate Rule **(x,y) → (-x, y)** Image Points A' (_____,_____) B' (_____,_____) C' (_____,_____)

9. Plot the preimage triangle. Determine the coordinates of the image, plot the image and determine if it is an isometric transformation.



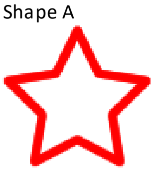
	Transformation
a) Pre-Image Points **A (-6,-4)** **B (-3,2)** **C (6,-4)** Isometry? Yes or No Transformation Type:	Coordinate Rule **(x,y) → (.5x, .5y)** Image Points A' (_____,_____) B' (_____,_____) C' (_____,_____)

Transformations – Symmetry

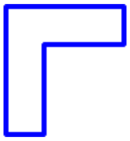
Hw T.2 ***(G.CO.A.3)***

1. Draw in the lines of symmetry for each of the shapes. If none, leave the diagram blank. Then determine the order and angle of rotation for each shape.

Shape A

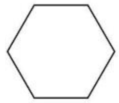


Shape B



Shape C

Shape D



Angle = ____° Angle = ____° Angle = ____° Angle = __°

Order = ____ Order = ____ Order = ____ Order = ___

2. Which of the shapes above have point symmetry?

3. What do you notice about the above shapes' orders?

Draw a figure that meets the symmetry requirements

4. line symmetry, but not rotational symmetry.

5. rotational symmetry, but not line symmetry.

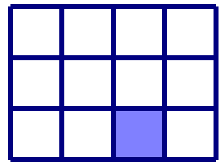
6. exactly 3 lines of symmetry.

7. Draw three different figures, each having exactly one line of symmetry.

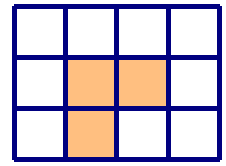
8. What do you notice about the similarities of the three shapes you drew in 7?

9. Shade each figure so it has the indicated number of reflectional symmetries.

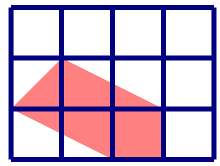
Exactly 1 Line of Symmetry



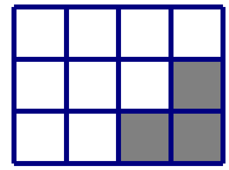
Exactly 1 line of symmetry



Exactly 2 lines of symmetry

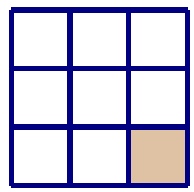


Exactly 2 lines of symmetry

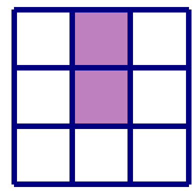


10. Shade each figure so it has rotational symmetry.

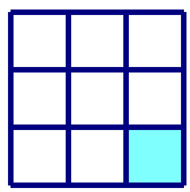
Order 2



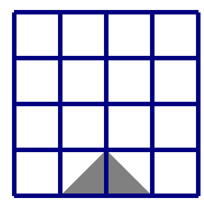
Order 2



Order 4

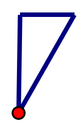


Order 4

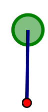


11. Each figure shows part of a shape with a center of rotation and a given rotational symmetry. Complete the figure.

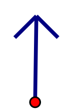
Order 4



Order 3

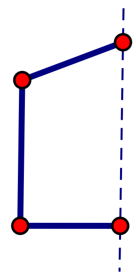


Order 8



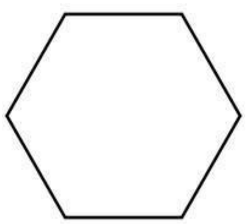
12. What is the relationship between the order of the shape and the angle of rotation?

13. Provided is half of a shape and the line of reflection. Complete drawing the shape. Using dashes marks to show equal sides – label each of the sides to show who is equal to who in the shape. Do the same for angles, label which angles are equal to each other in the shape using matching symbols.



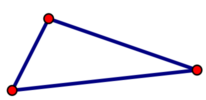
What do you notice about a shape that has one line of symmetry?

14. Given a regular hexagon, how can you alter it so that instead of having six lines of reflection it only has two? Draw the altered hexagon and draw in the two lines of symmetry.



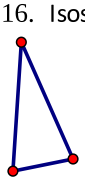
Determine the reflectional and rotational symmetries of triangles.

15. Scalene Triangle How many lines of symmetry?



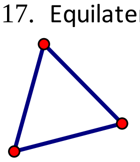
What is the order of rotational symmetry?

16. Isosceles Triangle How many lines of symmetry?



What is the order of rotational symmetry?

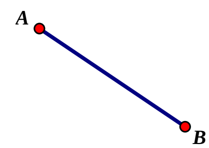
17. Equilateral Triangle How many lines of symmetry?



What is the order of rotational symmetry?

18. Could a triangle have exactly 2 lines of symmetry? Explain.

19. Given $\overline{AB}$, determine the following.



a) Does it have point symmetry? ____________

b) How many lines of symmetry does it have? _____

Hint: it is not 1 line of symmetry

c) Draw in the line(s) of symmetry.

d) What is the unique name for the one of the lines of symmetry?

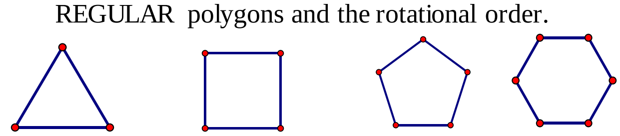
e) What is rotational symmetry order? _________

20. A triangle either has zero, one or three lines of symmetry. What is the possible number of lines symmetries for a hexagon? Draw in the ones that you found.

0 lines 1 line 2 lines

3 lines 4 lines 5 lines 6 lines

21. Determine the number of lines of symmetry for these REGULAR polygons and the rotational order.



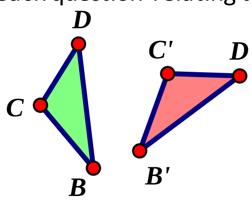
LoS = ____	LoS = ____	LoS = ____	Los = ____
Order = ____	Order = ____	Order = ____	Order = ___

Transformations – Isometries

Hw T.3 ***(G.CO.A.4)***

Answer each question relating the preimage to the image.

1.



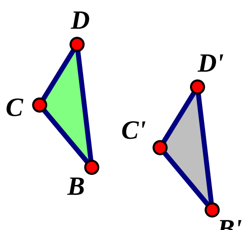
A. Which transformation has taken place?

B. Distances (Same or Different)

C. Orientation (Same or Different)

D. Special Points

2.



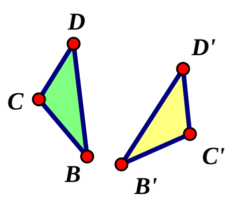
A. Which transformation has taken place?

B. Distances (Same or Different)

C. Orientation (Same or Different)

D. Special Points

3.



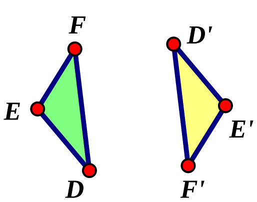
A. Which transformation has taken place?

B. Distances (Same or Different)

C. Orientation (Same or Different)

D. Special Points

4.



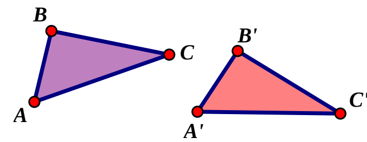
A. Which transformation has taken place?

B. Distances (Same or Different)

C. Orientation (Same or Different)

D. Special Points

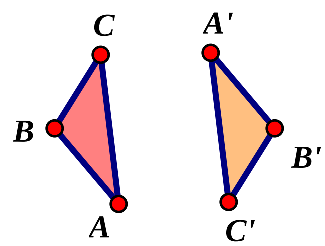
5. Given that ΔABC was mapped to ΔA′B′C′ using a single transformation.



a) Why couldn't this mapping have resulted by a single translation?

b) What transformation must have mapped these two triangles? Explain your answer.

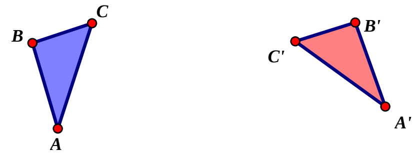
6. Given that ΔABC was mapped to ΔA′B′C′ using a single transformation.



a) Why couldn't this mapping have resulted by a single reflection?

b) What transformation must have mapped these two triangles? Explain your answer.

7. ΔABC is congruent to ΔA'B'C'. A student tries to determine which of these single transformations mapped ΔABC onto ΔA'B'C'. She concludes that a reflection had to be involved and more than one transformation had to map these on two triangles.



a. How can she conclude that a reflection was involved?

b. How can she conclude that this wasn't just a single reflection?

8. Determine the location of Point A,

a) after a reflection A = A', where was point A?

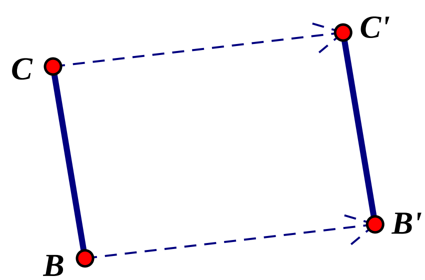
b) after a rotation of 27° A = A', where was point A?

9. After a reflection AA' = 24 cm, how far was A away from the line of reflection?

10. If after a reflection A = A' and BB' = 6 cm. What is the relationship between $\angle$BAB' and the line of reflection. Draw a diagram.

11. The distance from point A to the line of reflection is 10 cm, and the distance from point B to the line of reflection is also 10 cm. Jeffrey concludes that B is the image of A under a reflection. What do you think of this conclusion?

12. $\overline{BC}$ was translated by the arrow making $\overline{BC} \cong \overline{B'C'}$ and $\overline{BC} \parallel \overline{B'C'}$.



a) What other segments in the diagram are congruent?

b) What other segments in the diagram are parallel?

Translations

Review T.1 – T.3

TRUE/FALSE

________1. A rotation is an isometry.

________2. $T(x, y) \rightarrow (x, y + 5)$ is an isometric transformation.

________3. A rotational symmetry of order 2 means that the angle of the order is 90°.

________4. It is impossible to have a shape with 3 lines of symmetry.

________5. If ΔMNP is mapped to ΔM'P'N' by a single transformation, then it had to be a reflection

________6. If $T_{<6,0>}\left(\Delta ABC\right) = \Delta DEF$ then BE = 6 units.

________7. T(x,y) -----> (x + 2, y) moves every point in the plane to a new location.

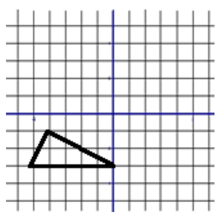
MULTIPLE CHOICE

______________8. Which shape property is not guaranteed in an isometric transformation?

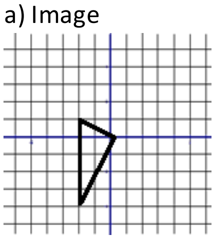
A) Distances
B) Angles
C) Collinearity
D) Location

9. Determine if the following are isometric or not.

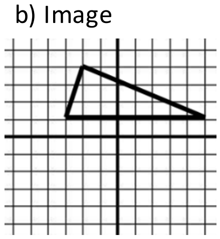
Pre-Image



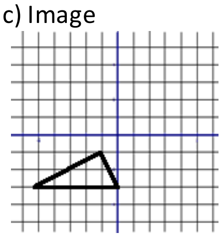
a) Image



b) Image



c) Image



Isometry?
Y or N

Isometry?
Y or N

Isometry?
Y or N

______________10. Which of the following is an isometric transformation of  ? Choose all that apply.

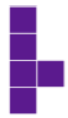
A) 

B) 

C) 

D) 

______________11. Which of the following is an isometric transformation of  :

A) 

B) 

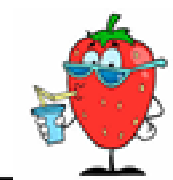
C) 

D) 

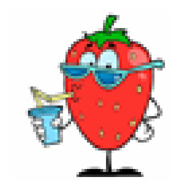
______________12. Which term describes a transformation that does not alter a figures shape or size?

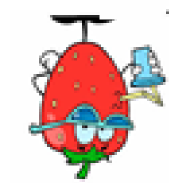
A) Symmetry
B) Similarity
C) Isometry
D) Transformation

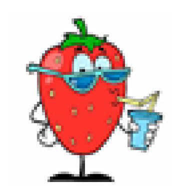
______________13. Which of the following is an isometric transformation of the pre-image? Choose all that apply.

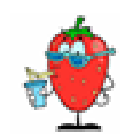


Pre-Image

A) 

B) 

C) 

D) 

_______________14. When a line divides a shape into two congruent parts that line is known as:

A) the line of symmetry
B) the line of axis
C) the dividing line
D) the transversal line

_______________15. How many lines of symmetry does the shape have?

A) 1 lines of symmetry
B) 2 line of symmetry
C) 4 lines of symmetry
D) 8 lines of symmetry

_______________16. This shape has:

A) Only Rotational Symmetry
B) Only Reflectional Symmetry
C) Both Rotational & Reflectional Symmetries
D) Neither symmetry

_______________17. What is the angle of rotational symmetry when the order is 10?

A) 18°
B) 36°
C) 45°
D) 72°

_______________18. Which of the following would have the greatest lines of symmetry?

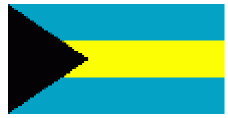
A) A Square
B) Irregular Hexagon
C) Equilateral Triangle
D) Regular Hexagon

_______________19. Which of the follow have both rotational and reflectional symmetry? Choose all that apply.

A) Parallelogram
B) Rhombus
C) Equilateral Triangle
D) Rectangle

_______________20. Which flag has 2 lines of symmetry and an order 2 rotational symmetry?

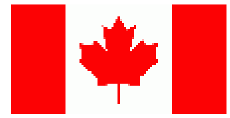
A) Bahama's



B) Austria

C) Bouvet Island

D) Canada



_______________21. If an 8 sided polygon had 8 lines of symmetry and a rotational order of 8, the best name for it would be:

A) Symmetrical
B) Regular
C) Special
D) Perfect

_______________22. ΔABC is reflected to create image ΔA'B'C'. Which statement is always true?

A) $\overline{AB} \parallel \overline{A'B'}$
B) $\overline{AA'} \perp \overline{BB'}$
C) $\overline{AB} \perp \overline{A'B'}$
D) $\overline{AA'} \parallel \overline{BB'}$

_______________23. If $R_{O,180^\circ}(H) = T$, which of the below statement is true. Choose all that apply.

A) $\overrightarrow{OH}$ and $\overrightarrow{OT}$ are opposite rays
B) $m\angle TOH = 180^\circ$
C) T is on $\overleftrightarrow{OH}$
D) $\angle$HTO is a straight angle

_______________24. If A(0,4), which of the following transformation would map A = A'?

a) $R_{A,180^\circ}$
b) Translate by <-3,0>
c) $r_{x\ axis}$
d) $r_{x=4}$

_______________25. A figure is transformed in a plane such that no point maps to itself. Which transformation must it be?

A) Reflection
B) Translation
C) Rotation
D) Dilation

SHORT ANSWER

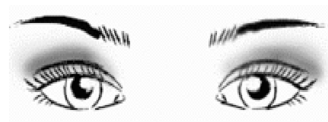
26. Given coordinate rule, $T(x,y) \longrightarrow (x-5, 2y)$ determine the image of A(-9,3)?

27. Given coordinate rule, $T(x,y) \longrightarrow (x, x+y)$ determine the image of A(-4,5)?

28. Given coordinate rule, $T(x,y) \longrightarrow (-x^2, x-5)$ determine the image of A(-2,2)?

29. Given coordinate rule, $T(x,y) \longrightarrow (x+2, y-6)$ determine the pre-image of A'(-2,2)?

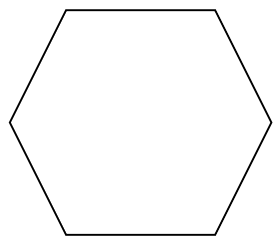
30. Draw in the lines of symmetry for each of the shapes. If none, leave the diagram blank.



31. Determine the rotational symmetry order and angle of rotation for each diagram. If none, write 1.

Order = ______________

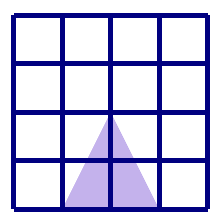
Angle = ______________



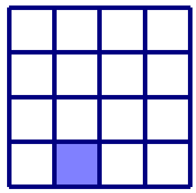
Order = ________________

Angle = _________________

32. Given the shape, shade it so it has exactly one line of symmetry



33. Given the shape, shade it so that it has rotational symmetry of order 4



34. If point A is reflected over line m and A = A'. What do we know about the location of point A?

35. ΔABC is reflected over line g to create the image $\Delta A'B'C'$. What is the relationship between $\overline{AA'}$, $\overline{BB'}$ and $\overline{CC'}$?

36. Determine the smallest positive angle of rotation that would perform the same rotation as the given one.

a) $R_{O,-60^\circ} = R_{O,\_\_\_\_\_\_\_}{}^\circ$

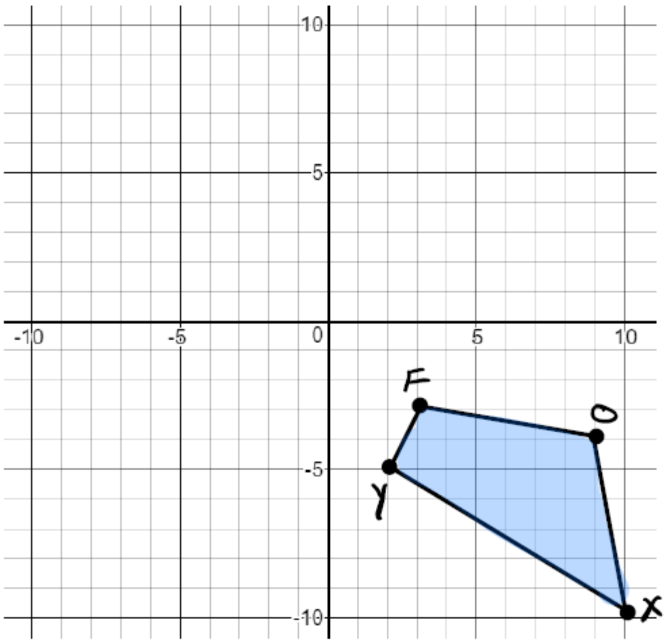
b) $R_{O,721^\circ} = R_{O,\_\_\_\_\_\_\_}{}^\circ$

c) $R_{O,-90^\circ} = R_{O,\_\_\_\_\_\_\_}{}^\circ$

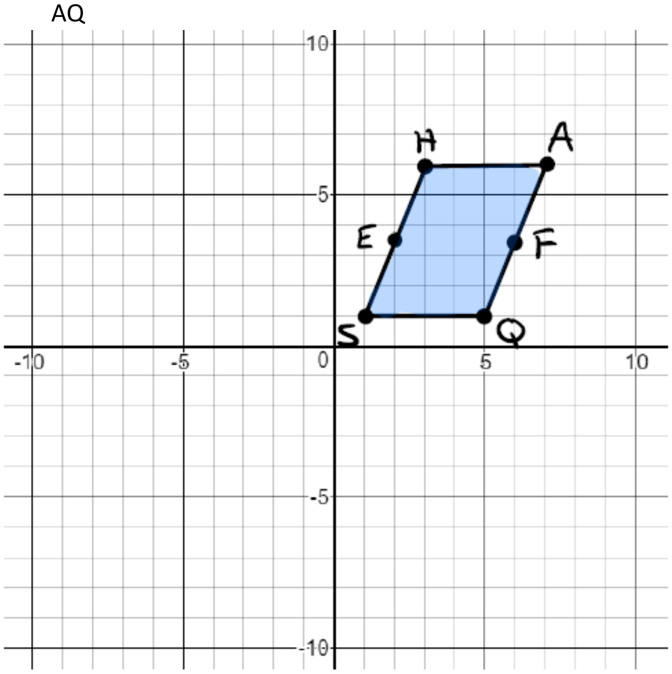
37. Point B is reflected over $\overleftrightarrow{GH}$ resulting in G being the midpoint of $\overline{BB'}$. What is the m $\angle$BGH? Draw a diagram and explain your answer.

Midterm Review

1. Reflect FOXY across line y = x.



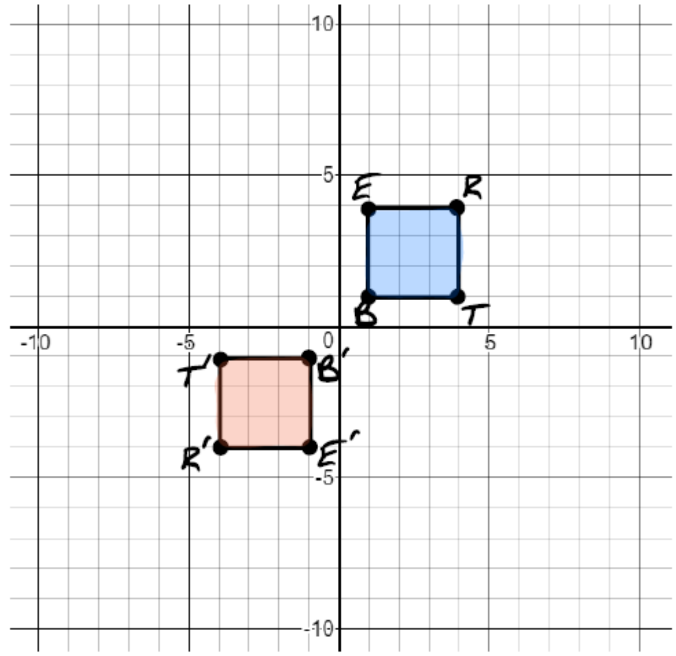
2. Parallelogram SHAQ is shown. Point E is the midpoint of segment SH. Point F is the midpoint of segment AQ



Which transformation carries the parallelogram onto itself?

A) A reflection across line segment SA
B) A reflection across line segment EF
C) A rotation of 180 degrees clockwise about the origin
D) A rotation of 180 degrees clockwise about the center of the parallelogram.

3. Square BERT is transformed to create the image B'E'R'T', as shown.



Select all of the transformations that could have been performed.

A) A reflection across the line y = x
B) A reflection across the line y = -2x
C) A rotation of 180 degrees clockwise about the origin
D) A reflection across the x-axis, and then a reflection across the y-axis.
E) A rotation of 270 degrees counterclockwise about the origin, and then a reflection across the x-axis.

4. Smelly Kid performs a transformation on a triangle. The resulting triangle is similar but not congruent to the original triangle. Which transformation did Smelly Kid perform on the triangle?

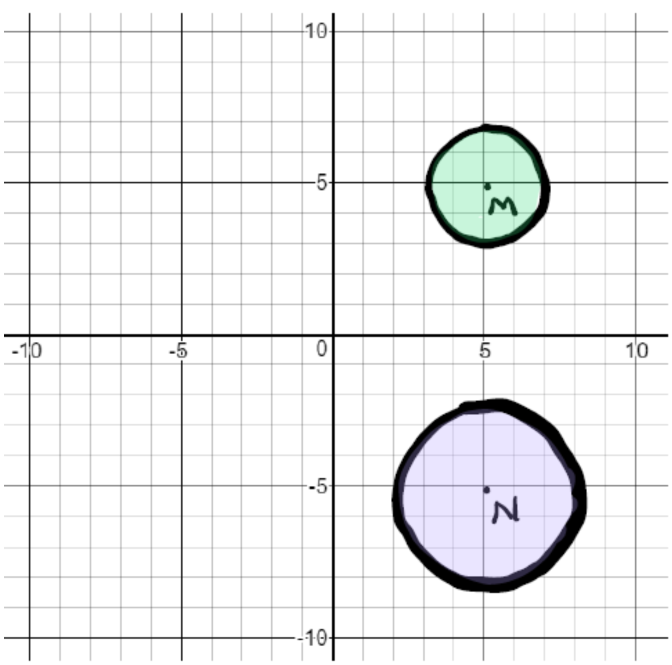
A) Dilation
B) Reflection
C) Rotation
D) Translation

5. Triangle ABC had vertices of A(1, 1), B(2.5, 3) and C(0, -3). It is dilated by a scale factor of ½ about the origin to create triangle A'B'C'. What is the length, in units, of side $\overline{B'C'}$?

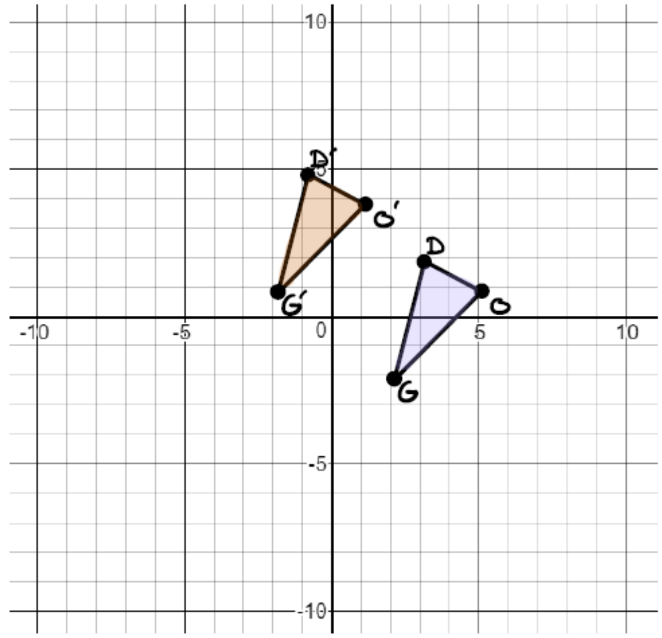
6. Complete the statement to explain how it can be shown that two circles are similar.
Circle M can be mapped onto circle N by a reflection

across ______________________ and a dilation about the center of circle M by a scale factor of

____



7. A translation is applied to ΔDOG to create $\Delta D'O'G'$.

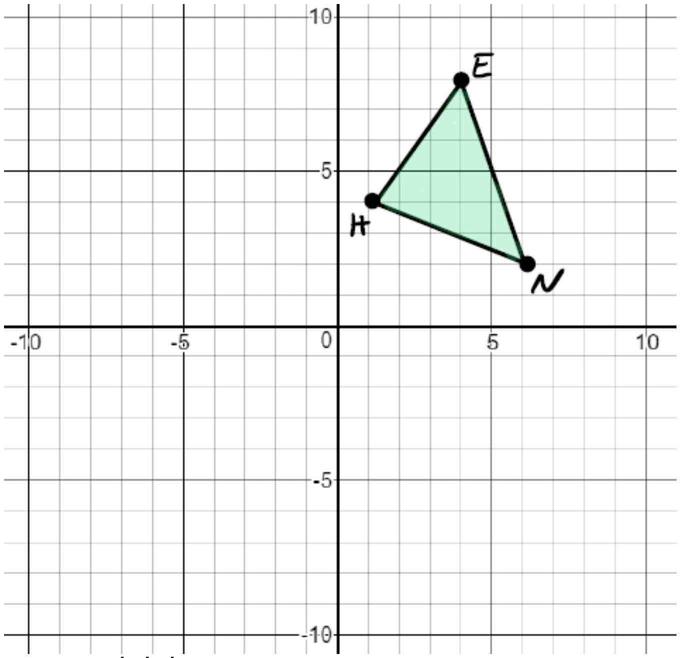


Let the statement $(x, y) \rightarrow (a, b)$ describe the translation. Create equations for *a* in terms of *x* and for *b* in terms of *y* that could be used to describe the translation.

a = ______________________

b = ______________________

8. Triangle HEN is shown.



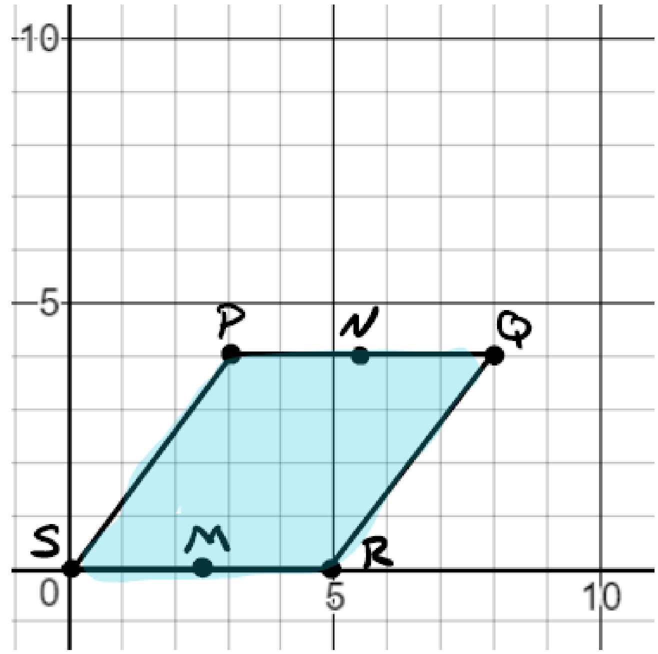
Triangle $H'E'N'$ is created by dilating triangle HEN by a scale factor of 4. What is the length of $\overline{H'E'}$?

9. A figure is fully contained in Quadrant II. The figure is transformed as shown.
   - A reflection over the x-axis
   - A reflection over the line y = x
   - A 90° counterclockwise rotation about the origin.

In which quadrant does the resulting image lie?

A) Quadrant I
B) Quadrant II
C) Quadrant III
D) Quadrant IV

10. Rhombus PQRS is shown in the coordinate plane. Points M and N are midpoints of their respective sides.



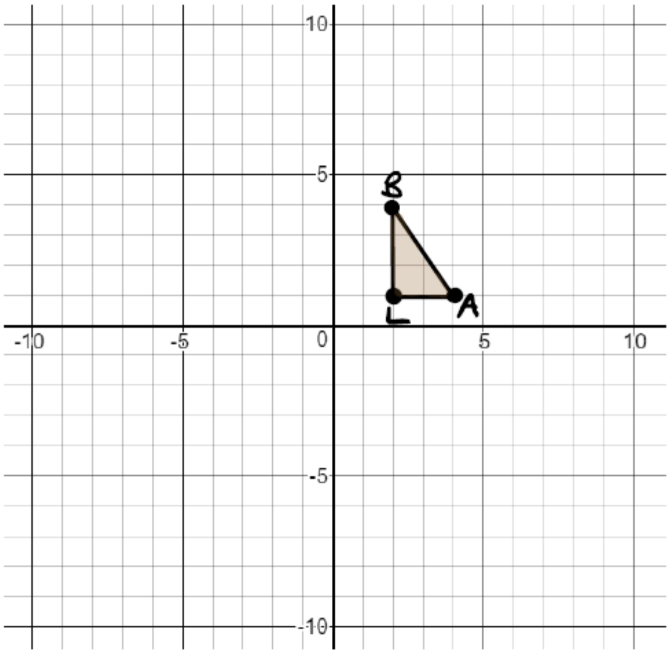
Select all of the transformations that map the rhombus onto itself.

A) A $90°$ clockwise rotation around the center of the rhombus
B) A $180°$ clockwise rotation around the center of the rhombus
C) A reflection across $\overline{NM}$
D) A reflection across $\overline{QS}$

11. Triangle ABC is reflected across the line y = 2x to form triangle RST. Select all of the true statements.

A) $\overline{AB} = \overline{RS}$ (I know this notation is wrong, but some moron used this wrong notation on the state test.)
B) $\overline{AB} = 2 \cdot \overline{RS}$ (I know this notation is wrong, but some moron used this wrong notation on the state test.)
C) $\Delta ABC \sim \Delta RST$
D) $\Delta ABC \cong \Delta RST$
E) $m\angle BAC = m\angle SRT$
F) $m\angle BAC = 2 \cdot m\angle SRT$

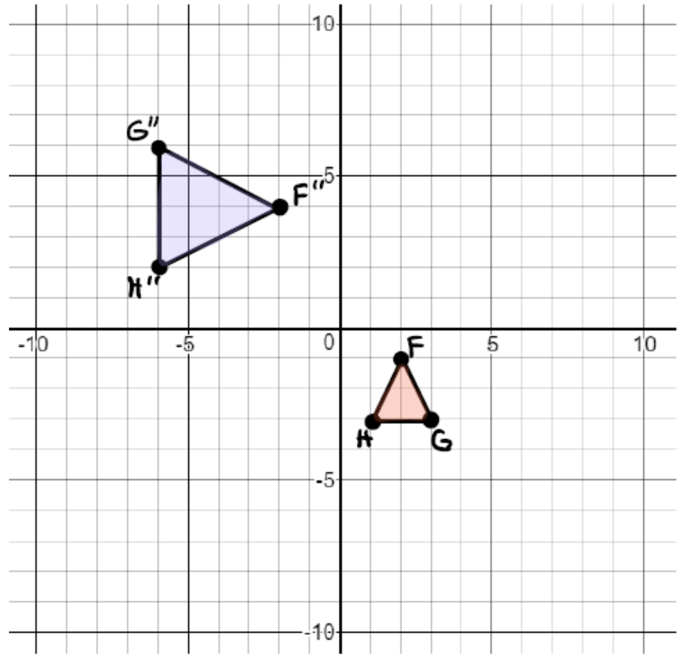
12. Triangle BAL is reflected across the line y = x. Draw the resulting triangle.



13. All corresponding sides and angles of ΔRST and ΔDEF are congruent. Select all of the statements that must be true.

A) There is a reflection that maps $\overline{RS}$ to $\overline{DE}$
B) There is a dilation that maps ΔRST to ΔDEF
C) There is a translation followed by a rotation that maps $\overline{RT}$ to $\overline{DF}$
D) There is a sequence of transformations that maps ΔRST to ΔDEF
E) There is not necessarily a sequence of rigid motions that maps ΔRST to ΔDEF

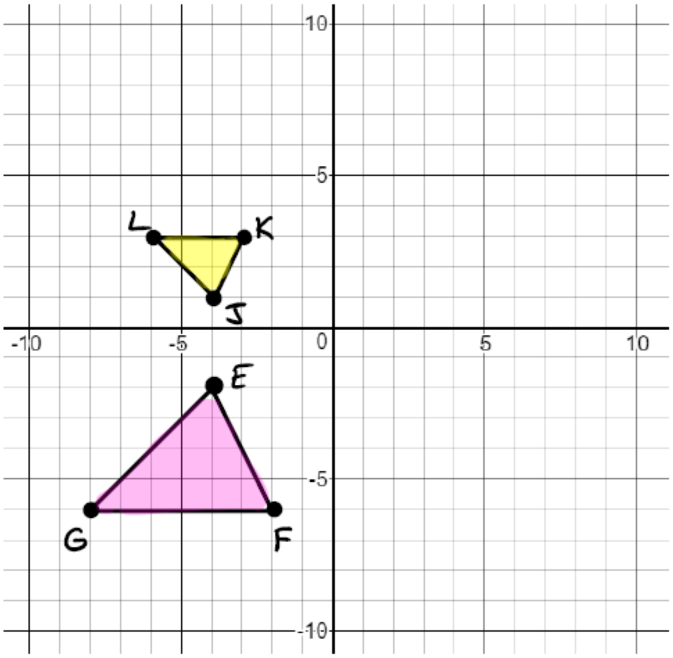
14. The coordinate plane shows ΔFGH and $\Delta F''G''H''$



Which sequence of transformations can be used to show that $\Delta FGH \sim \Delta F''G''H''$?

A) A dilation about the origin with a scale factor of 2, followed by a $180°$ clockwise rotation about the origin.
B) A dilation about the origin with a scale factor of 2, followed by a reflection over the line y = x
C) A translation 5 units up and 4 units left, followed by a dilation with a scale factor of ½ about point F''
D) A $180°$ clockwise rotation about the origin, followed by a dilation with a scale factor of ½ about F''

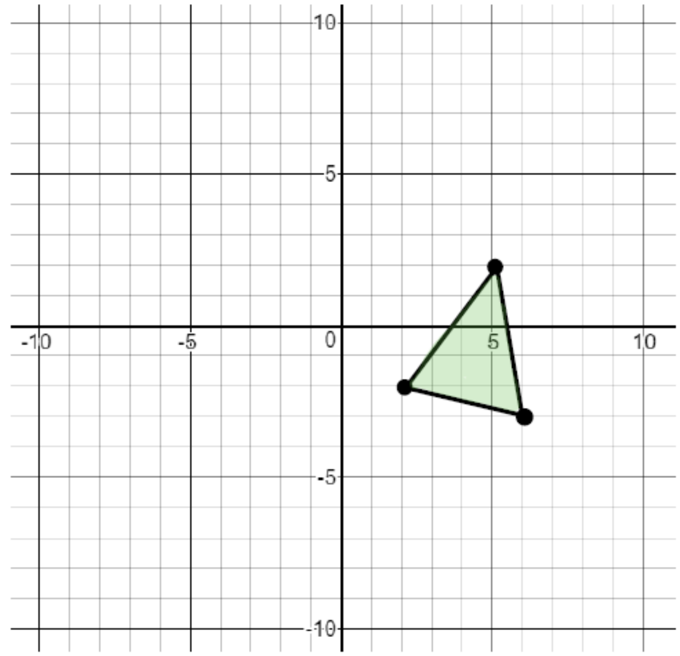
15. Two triangles are shown.



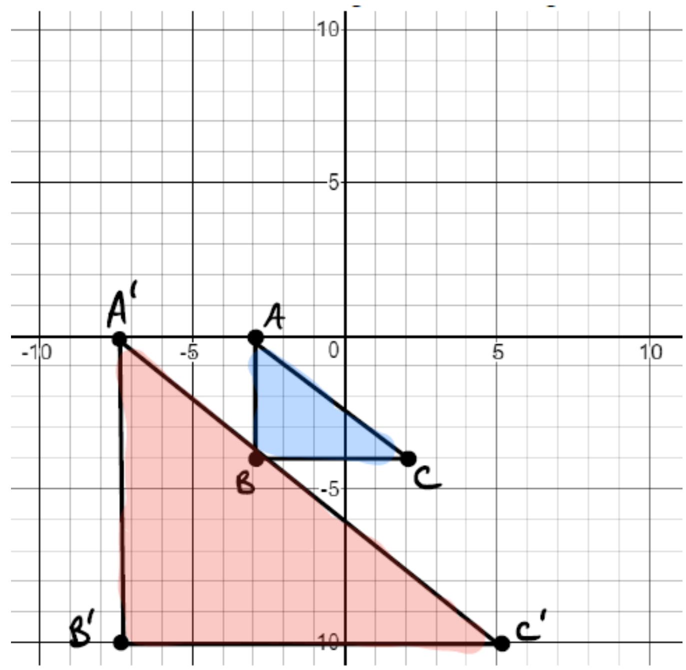
Which sequence of transformations could be performed on ΔEFG to show that it is similar to ΔJKL?

A) Rotate ΔEFG $90°$ clockwise about the origin, and then dilate it by a scale factor of ½ with a center of dilation at point F'
B) Rotate ΔEFG $180°$ clockwise about point E, and then dilate it by a scale factor of 2 with a center of dilation at point E'
C) Translate ΔEFG 1 unit up, then reflect it across the x-axis, and then dilate it by a factor of ½ with a center of dilation at point E"
D) Reflect ΔEFG across the x-axis, then reflect it across the line y = x, and then dilate it by a scale factor of 2 with a center of dilation at point F"

16. A triangle is shown on the coordinate grid. Draw the triangle after a transformation following the rule $(x, y) \rightarrow (x - 4, y + 3)$



17. Triangle ABC is dilated with a scale factor of k and a center of dilation at the origin to obtain triangle A'B'C'.



What is the scale factor?

18. A square is rotated about its center. Select all of the angles of rotation that will map the square onto itself.

    A) 45 degrees
    B) 60 degrees
    C) 90 degrees
    D) 120 degrees
    E) 180 degrees
    F) 270 degrees

This problem is for Math Rockstars only

19. Circle J is located in the first quadrant with center (a, b) and radius s. Felipe transforms Circle J to prove that it is similar to any circle centered at the origin with radius t. Which sequence of transformations did Felipe use?

    A) Translate Circle J by $(x + a, y + b)$ and dilate by a factor of $\frac{t}{s}$
    B) Translate Circle J by $(x + a, y + b)$ and dilate by a factor of $\frac{s}{t}$
    C) Translate Circle J by $(x - a, y - b)$ and dilate by a factor of $\frac{t}{s}$
    D) Translate Circle J by $(x - a, y - b)$ and dilate by a factor of $\frac{s}{t}$

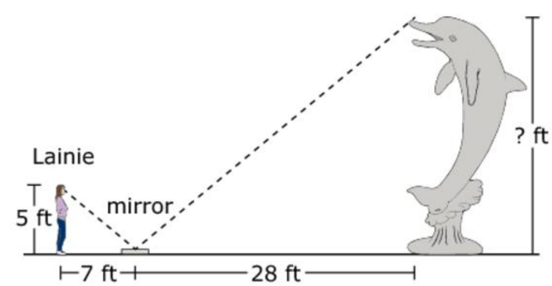
20. ______Kyle performs a transformation on a triangle. The resulting is similar but not congruent to the original triangle. Which transformation did Kyle use?

    E) Dilation
    F) Reflection
    G) Rotation
    H) Translation

21. A study reports that in 2010 the population of the United States was 308,745,538 people and the land area was approximately 3,531,905 square miles.

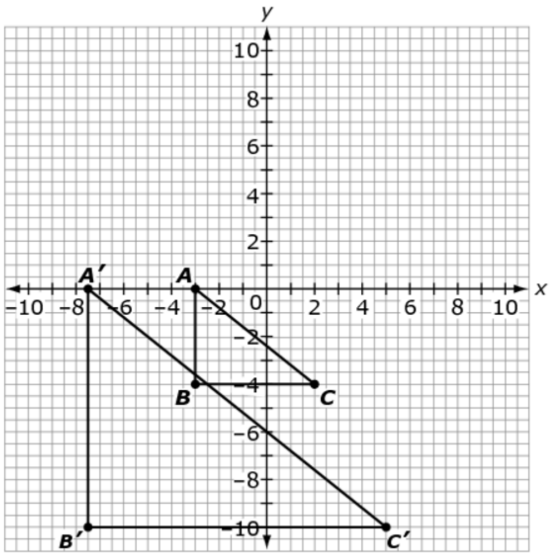
    Based on the study, what was the population density, in people per square mile, of the United States in 2010? Round your answer to the nearest tenth.

22. Lainie wants to calculate the height of the sculpture. She places a mirror on the ground so that when she looks into the mirror she sees the top of the sculpture, as shown.



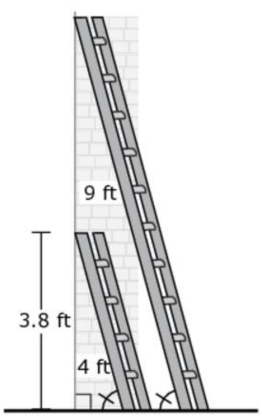
What is the height, in feet, of the sculpture?

23. Triangle ABC is dilated with a scale factor of k and a center of dilation at the origin to obtain triangle A'B'C'.



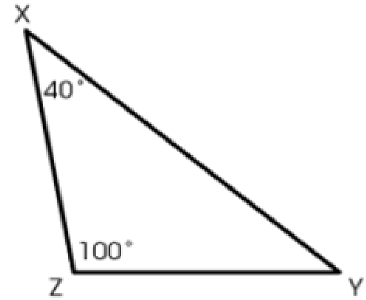
What is the scale factor?

24. A 9-foot ladder and a 4-foot ladder are leaning against a house. The two ladders create angles of the same measure with the ground. The 4-foot ladder has a height of 3.8 feet against the house.



What is the height, in feet, of the 9-foot ladder against the house?

25. Triangle XYZ is shown.



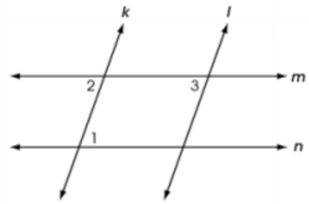
Which triangle must be similar to ΔXYZ?

A) A triangle with two angles that measure 40 degrees.
B) A triangle with angles that measure 40 and 60 degrees
C) A scalene triangle with only one angle that measures 100 degrees
D) An isosceles triangle with only one angle that measures 40 degrees

26. $\overline{AB}$ has endpoints A(-1.5, 0) and B(4.5, 8). Point C is on line $\overline{AB}$ and is located at (0, 2). What the ratio of $\frac{AC}{CB}$? Round to 2 decimal places.

27. $\overline{AC}$ has endpoints A(-1, -3.5) and C(5, -1). Point B is on $\overline{AC}$ and is located at (0.2, -3). What is the ratio of $\frac{AB}{BC}$?

28. Two pairs of parallel lines intersect to form a parallelogram as shown.

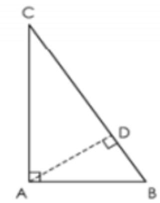


Place statements and reasons in the table to complete the proof that the opposite angles in a parallelogram are congruent.

Statement	Reason
1. $m \parallel n \text{ and } k \parallel l$	1. Given
2.	2.
3.	3.
4.	4.

A. $\angle 1 \cong \angle 2$
B. $\angle 1 \cong \angle 3$
C. $\angle 2 \cong \angle 3$
D. Alternate exterior angles theorem
E. Alternate interior angles theorem
F. Transitive property of congruence
G. Opposite angles are congruent
H. Corresponding angles postulate

29. James correctly proves the similarity of triangles DAC and DBA as shown.

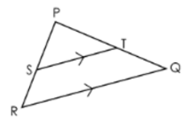


His incomplete proof is shown.

Statement	Reason
1. $m\angle CAB = m\angle ADB = 90°$	1. Given
2. $\angle ADB$ and $\angle ADC$ are a linear pair	2. Definition of linear pair
3. $\angle ADB$ and $\angle ADC$ are supplementary	3. Supplement postulate
4. $m\angle ADB + m\angle ADC = 180°$	4. Definition of supplementary angles
5. $90° + m\angle ADC = 180°$	5. Substitution PoE
6. $m\angle ADC = 90°$	6. Subtraction PoE
7. $\angle CAB \cong \angle ADB$ $\angle CAB \cong \angle ADC$	7. Definition of congruent angles
8. $\angle ABC \cong \angle DBA$ $\angle DCA \cong \angle ACB$	8. Reflexive property of congruent angles
9. $\Delta ABC \sim \Delta DBA$ $\Delta ABC \sim \Delta DAC$	9.
10. $\Delta DBA \sim \Delta DAC$	10. Substitution PoE

What is the missing reason for the 9th statement?
A) CPCTC
B) AA postulate
C) All right triangles are similar
D) Transitive property of similarity

30. ΔPQR is shown, where $\overline{ST} \parallel \overline{RQ}$



Marta wants to prove that $\frac{SR}{PS} = \frac{TQ}{PT}$.
Place a statement or reason in each blank box to complete Marta's proof.

Statement	Reason
1. $\overline{ST} \parallel \overline{RQ}$	1. Given
2. $\angle PST \cong \angle R$ $\angle PTS \cong \angle Q$	2. Corresponding angles postulate
3. $\Delta PQR \sim \Delta PTS$	3.
4.	4.
5. $PR = PS + SR$ $PQ = PT + TQ$	5. Segment addition postulate
6. $\frac{PS+SR}{PS} = \frac{PT+TQ}{PT}$	6. Substitution PoE
7. $\frac{PS}{PS} + \frac{SR}{PS} = \frac{PT}{PT} + \frac{TQ}{PT}$	7. Communitive PoE
8. $\frac{SR}{PS} = \frac{TQ}{PT}$	8. Subtraction PoE

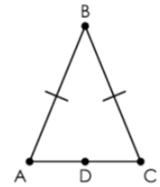
A. $\frac{PR}{PS} = \frac{PQ}{PT}$

B. $\frac{PS}{SR} = \frac{PT}{ST}$

C. $\angle P \cong \angle P$

D. AA Similarity
E. ASA Similarity
F. SSS Similarity
G. Reflexive Property
H. Segment addition postulate
I. Corresponding sides of similar triangles are proportional
J. Corresponding sides of similar triangles are congruent
K. Alternate interior angles theorem
L. Alternate exterior angles theorem

31. Triangle ABC is shown.

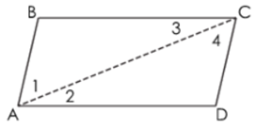


Given: ΔABC is isosceles. Point D is the midpoint of $\overline{AC}$.
Prove: $\angle BAC \cong \angle BCA$

Statement	Reason
1. ΔABC is isosceles. D is the midpoint of $\overline{AC}$	1. Given
2. $\overline{AD} \cong \overline{DC}$	2. Definition of midpoint
3. $\overline{BA} \cong \overline{BC}$	3. Definition of isosceles triangle
4. $\overline{BD}$ exists	4. A line segment can be drawn between any two points
5. $\overline{BD} \cong \overline{BD}$	5.
6. $\Delta ABD \cong \Delta CBD$	6.
7. $\angle BAC \cong \angle BCA$	7.

AA congruency postulate
SAS congruency postulate
SSS congruency postulate
CPCTC
Reflexive property
Symmetric property
Midpoint theorem

32. The proof shows that opposite angles of a parallelogram are congruent.

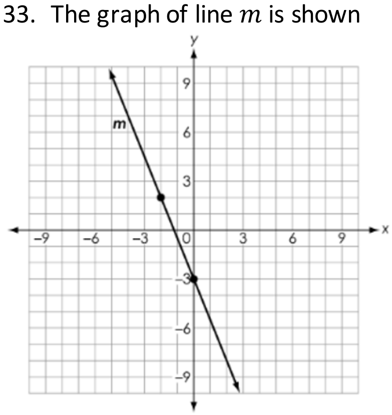


Given: ABCD is a parallelogram with diagonal $\overline{AC}$
Prove: $\angle BAD \cong \angle DCB$

Statement	Reason
1. ABCD is a parallelogram with diagonal $\overline{AC}$	1. Given
2. $\overline{AB} \parallel \overline{CD}$ and $\overline{AD} \parallel \overline{BC}$	2. Definition of parallelogram
3. $\angle 2 \cong \angle 3$ $\angle 1 \cong \angle 4$	3. Alternate interior angles theorem
4. $m\angle 2 = m\angle 3$ $m\angle 1 = m\angle 4$	4. Definition of congruent angles
5. $m\angle 1 + m\angle 2 = m\angle 4 + m\angle 2$	5. Addition property of equality
6. $m\angle 1 + m\angle 2 = m\angle 4 + m\angle 3$	6.
7. $m\angle 1 + m\angle 2 = m\angle BAD$ $m\angle 3 + m\angle 4 = m\angle DCB$	7. Angle addition postulate
8. $m\angle BAD = m\angle DCB$	8. Substitution PoE
9. $\angle BAD \cong \angle DCB$	9. Definition of congruent angles

What is the missing reason in this partial proof?
A) ASA
B) Substitution PoE
C) Angle addition postulate
D) Alternate interior angles postulate

33. The graph of line m is shown



What is the equation of the line that is perpendicular to line m and passes through the point (3, 2)?

34. Square ABCD has vertices at A(1, 2) and B(3, -3). What is the slope of $\overline{BC}$?

35. Kevin asked Olivia what parallel lines are. Olivia responded, “They are lines that never intersect.” What important piece of information is missing form Olivia’s response?
A. The lines must be straight.
B. The lines must be coplanar.
C. The lines can be noncoplanar.
D. The lines form four right angles.

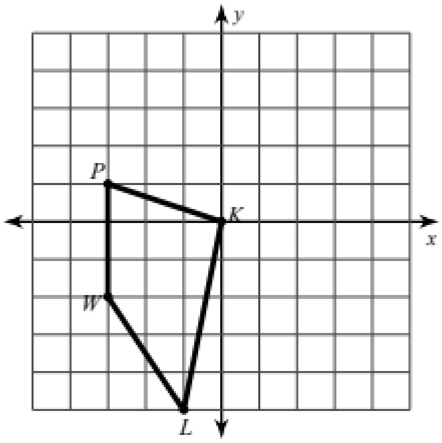
36. Triangle ABC has vertices at (-4, 0), (-1, 6) and (3, -1). What is the perimeter of triangle ABC, rounded to the nearest tenth?

Translations

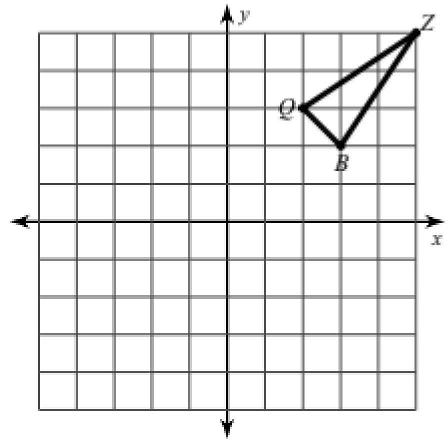
Hw T.4 ***(G.CO.A.5)***

Graph and label the image of the figure using the transformation given.

1) translation: $(x, y) \rightarrow (x + 1, y + 4)$



2) translation: $\langle -5, -4 \rangle$



Find the coordinates of the vertices of each figure after the given transformation.

3) translation: 2 units left and 3 units up
$A(4, -5)$, $S(3, -2)$, $E(5, -5)$

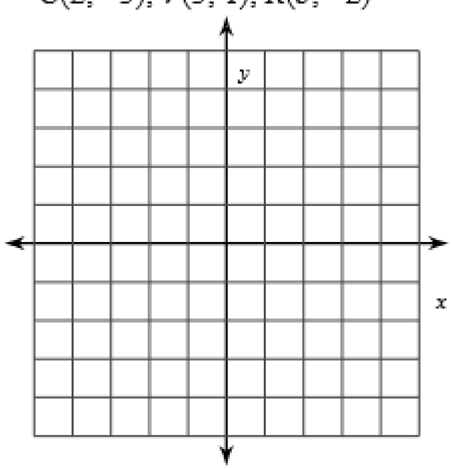
4) translation: 1 unit left and 1 unit up
$D(-4, 0)$, $J(0, 3)$, $H(-1, -1)$

5) translation: 3 units up
$U(4, -3)$, $P(3, 1)$, $S(5, 1)$

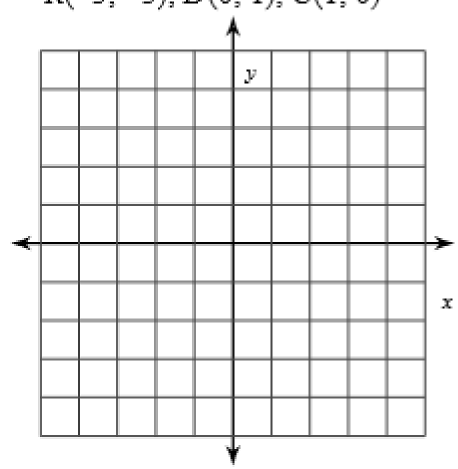
6) translation: 1 unit right and 2 units down
$C(-1, -3)$, $W(2, -2)$, $N(4, -3)$

Graph the image and the preimage of the figure using the transformation given.

7) translation: $(x, y) \rightarrow (x - 5, y + 4)$
$C(2, -3)$, $V(3, 1)$, $R(5, -2)$

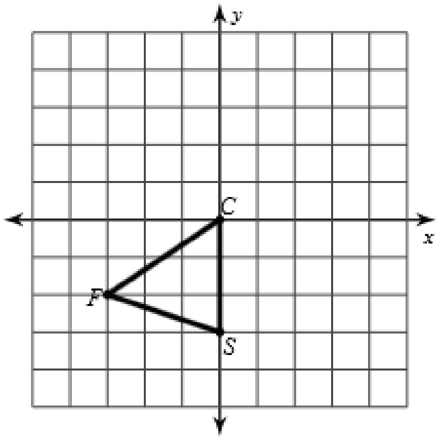


8) translation: $(x, y) \rightarrow \langle -1, 4 \rangle$
$R(-3, -3)$, $D(0, 1)$, $C(1, 0)$

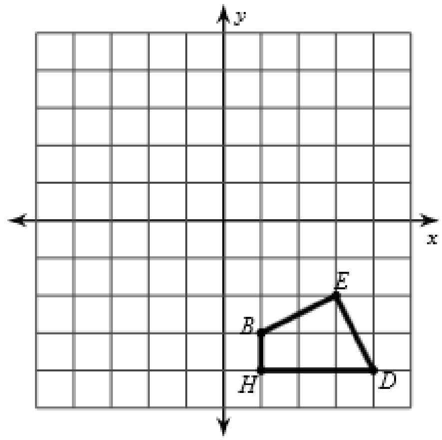


Graph the image of the figure using the transformation given.

9) $T_{3,0}$

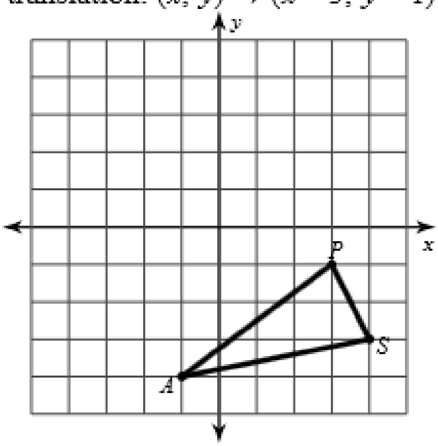


10) translation: $(x, y) \rightarrow (x - 1, y + 5)$

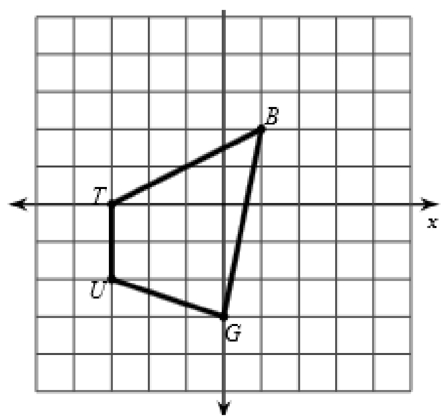


Find the coordinates of the vertices of each figure after the given transformation.

11) translation: $(x, y) \rightarrow (x - 3, y - 1)$



12) $T_{3,-2}$

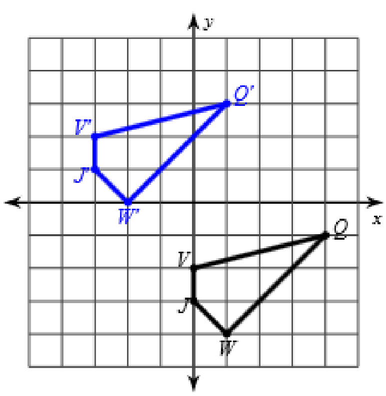


13) translation: $(x, y) \rightarrow (x - 5, y + 4)$
$H(1, -1)$, $W(2, 0)$, $E(4, -5)$, $Y(3, -5)$

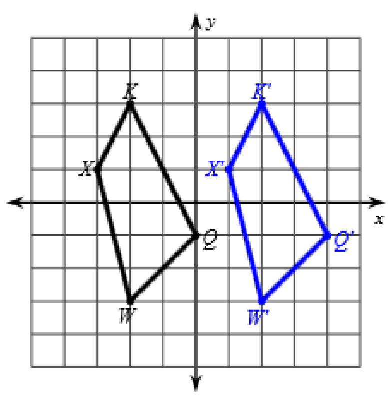
14) translation $\langle 6, -3 \rangle$
$M(-4, 4)$, $Z(-4, 5)$, $E(-1, 5)$, $K(-1, 3)$

Write an algebraic rule to describe each transformation.

15)



16)



17) $L(-5, -3)$, $X(-4, -1)$, $J(-3, -1)$, $Z(-5, -5)$
to
$L'(-2, -2)$, $X'(-1, 0)$, $J'(0, 0)$, $Z'(-2, -4)$

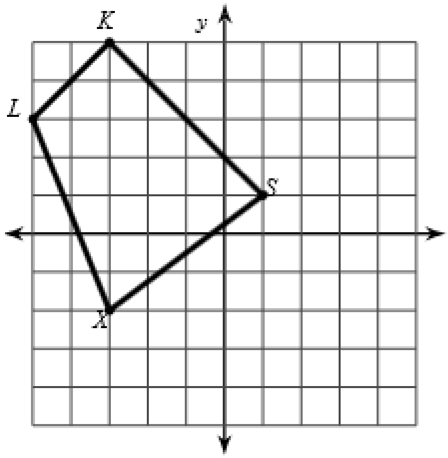
18) $V(-1, -3)$, $T(-3, 0)$, $B(-3, 1)$, $R(1, -2)$
to
$V'(2, -2)$, $T'(0, 1)$, $B'(0, 2)$, $R'(4, -1)$

Reflections

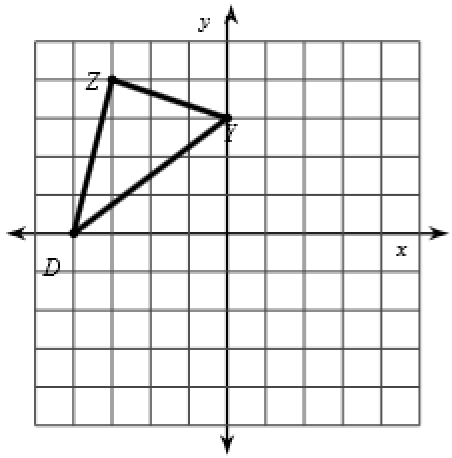
Hw T.5 ***(G.CO.A.5)***

Graph and label the image of the figure using the transformation given.

1) reflection across $y = x$



2) reflection across the x-axis



Find the coordinates of the vertices of each figure after the given transformation.

3) reflection across $x = 4$
$F(3, -5)$, $C(3, -4)$, $P(5, -4)$

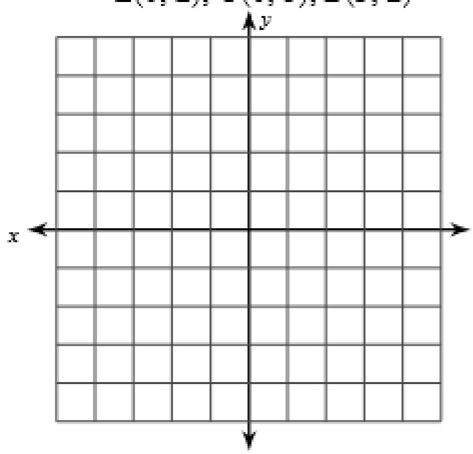
4) reflection across $y = -x$
$X(-4, -3)$, $M(-3, -2)$, $I(-1, -5)$

5) reflection across the y-axis
$N(-3, 1)$, $G(0, 4)$, $B(-1, 1)$

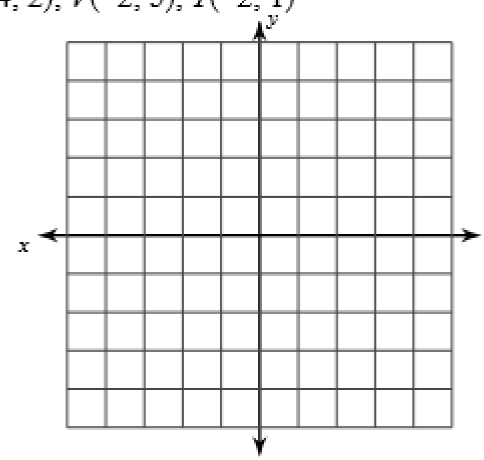
6) reflection across the x-axis
$W(-4, 4)$, $U(1, 5)$, $K(0, 0)$

Graph the image and the preimage of the figure using the transformation given.

7) reflection across x = -1
$Z(0, 2)$, $U(0, 5)$, $B(3, 2)$

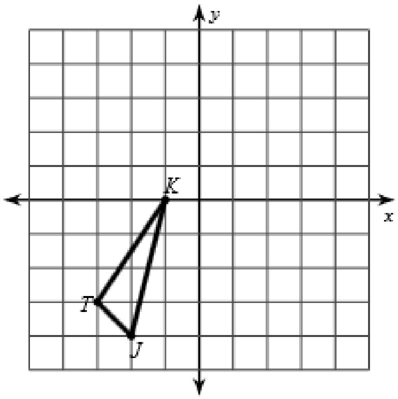


8) reflection across $y = x$
$C(-4, 2)$, $V(-2, 5)$, $T(-2, 1)$

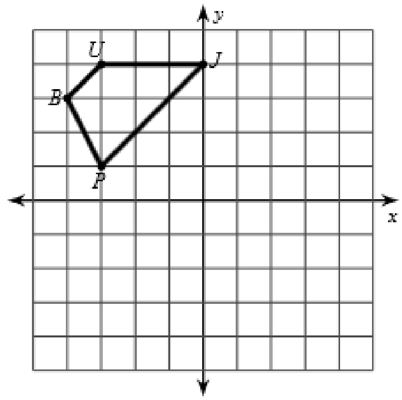


Graph the image and the preimage of the figure using the transformation given.

9) reflection across $y = -1$

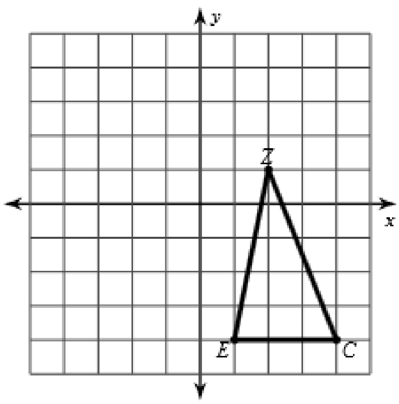


10) reflection across the y-axis

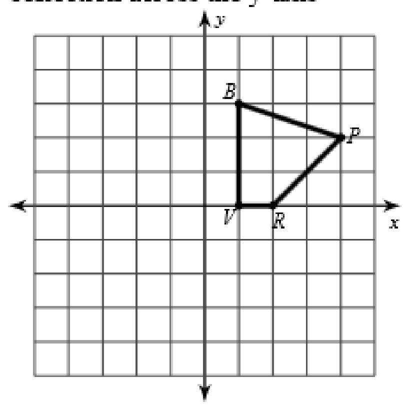


Find the coordinates of the vertices of each figure after the given transformation. Then graph the reflection.

11) reflection across $x = 1$



12) reflection across the y-axis

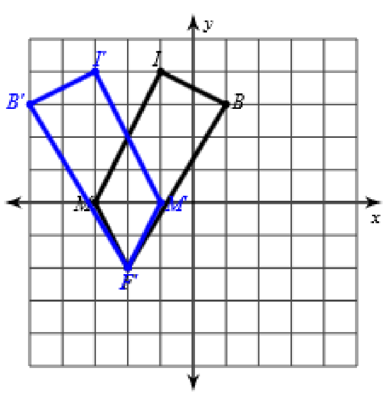


13) reflection across $x = -1$
$M(-3, 2), J(-2, 5), B(0, 4), V(-2, 1)$

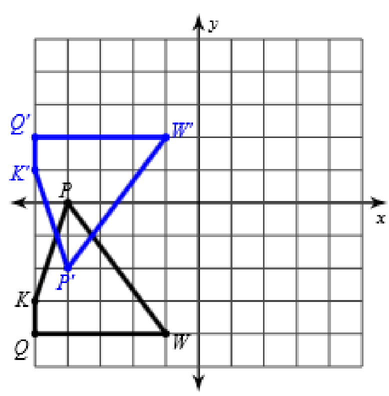
14) reflection across $y = -1$
$L(1, -2), V(2, 2), F(5, -1), D(4, -5)$

Tell the type of reflection that describes each transformation.

15)



16)



17) $Y(-4, 0), Q(-3, 2), L(2, 0), A(-2, -3)$
to
$Q'(2, -3), L'(0, 2), A'(-3, -2), Y'(0, -4)$

18) $B(3, -1), V(2, 2), Y(5, 5), J(5, 2)$
to
$V'(2, 2), Y'(5, 5), J'(2, 5), B'(-1, 3)$

End of Course Test Questions

Question 18

Triangle ABC is reflected across the line $y = 2x$ to form triangle RST.

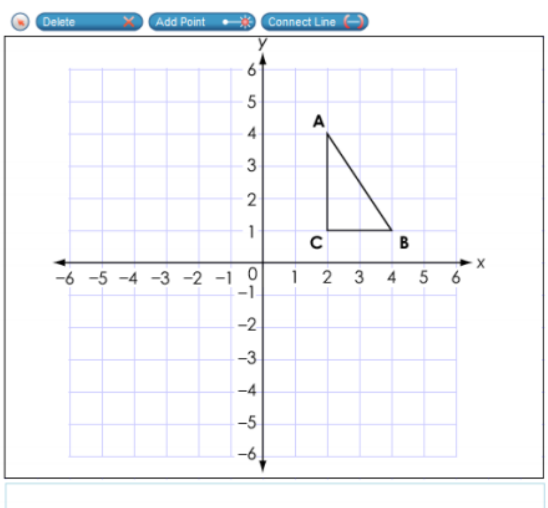
Select all of the true statements.

- ☐ $\overline{AB} = \overline{RS}$
- ☐ $\overline{AB} = 2 \bullet \overline{RS}$
- ☐ $\triangle ABC \sim \triangle RST$
- ☐ $\triangle ABC \cong \triangle RST$
- ☐ $m\angle BAC = m\angle SRT$
- ☐ $m\angle BAC = 2 \bullet m\angle SRT$

Question 20

Triangle ABC is reflected across the line $y = x$.

Use the Connect Line tool to create the resulting triangle on the coordinate grid.



2019

Question 4

A sequence of translations maps ΔGHI to $\Delta G'H'I'$.

- ΔGHI has vertices at $G(-8,2)$, $H(13,2)$, and $I(-2,10)$.
- The coordinates of G' are $(-1,\ -3)$.

What are the coordinates for H' and I'?

H'(______ , ______)

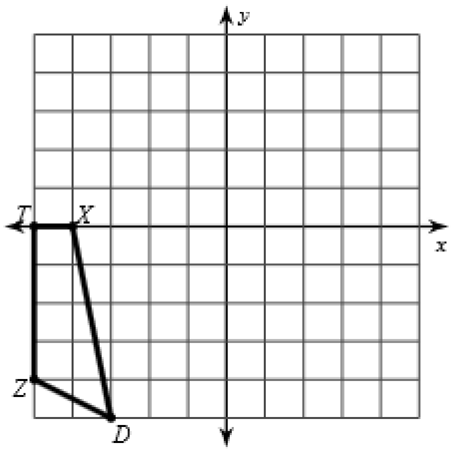
I' (______ , ______)

Rotations

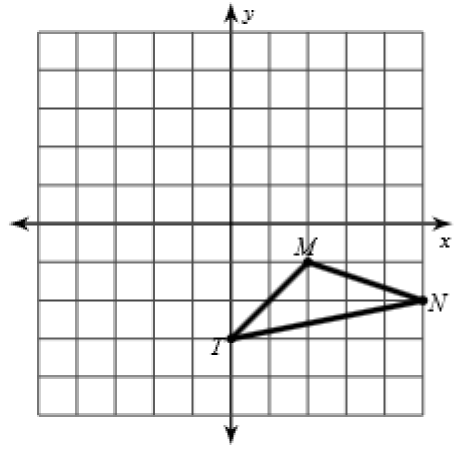
Hw T.6 ***(G.CO.A.5)***

Graph and label the image of the figure using the transformation given.

1) rotation 90° counterclockwise about the origin



2) rotation 180° about the origin



Find the coordinates of the vertices of each figure after the given transformation.

3) rotation 90° clockwise about the origin
$G(0, -3)$, $B(3, -1)$, $U(1, -5)$

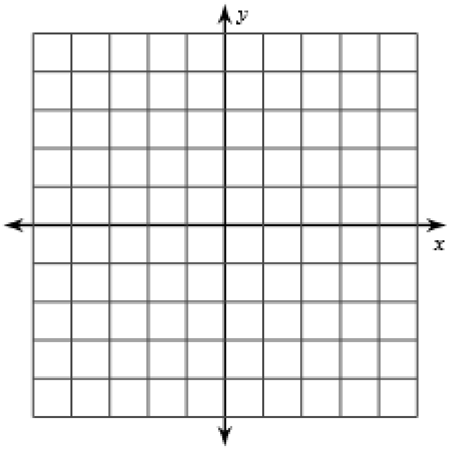
4) rotation 90° clockwise about the origin
$R(1, 1)$, $F(5, 4)$, $H(3, 1)$

5) rotation 180° about the origin
$I(1, 3)$, $F(5, 5)$, $C(4, 2)$

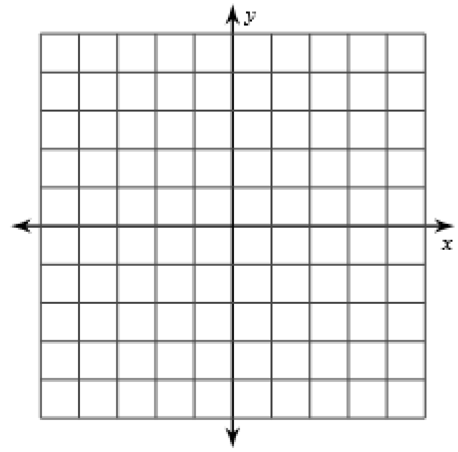
6) rotation 90° counterclockwise about the origin
$I(-5, 1)$, $X(-4, 5)$, $Q(-2, 0)$

Graph the image and the preimage of the figure using the transformation given.

7) rotation 90° counterclockwise about the origin
$G(0, -3)$, $B(-1, 1)$, $J(3, 0)$

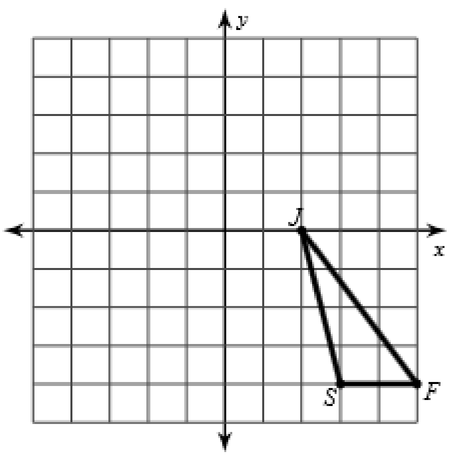


8) rotation 180° about the origin
$D(-5, 2)$, $S(-3, 3)$, $Q(-3, 2)$

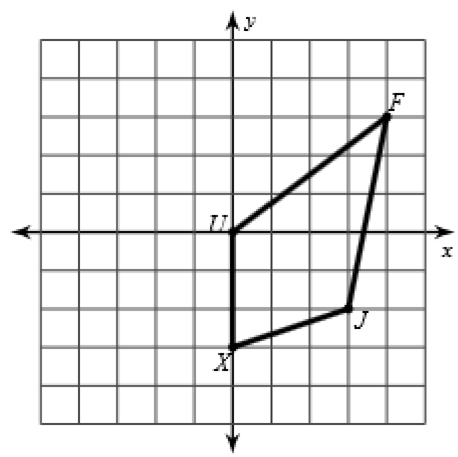


Graph the image and the preimage of the figure using the transformation given.

9) rotation 90° clockwise about the origin

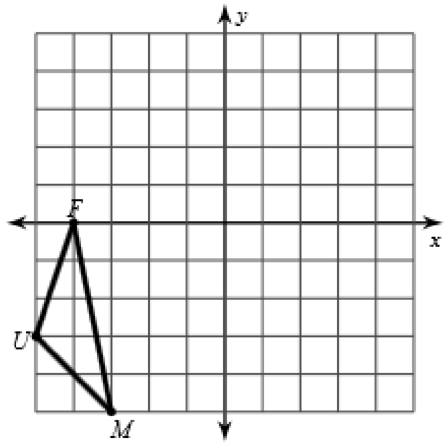


10) rotation 90° counterclockwise about the origin

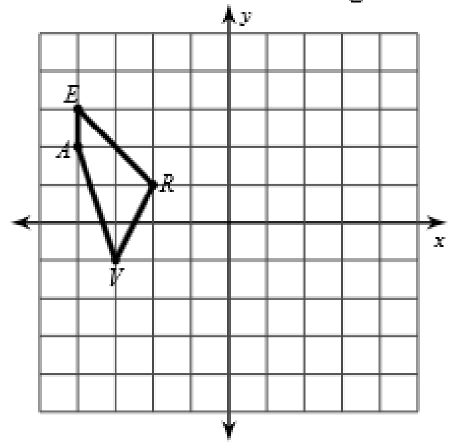


Find the coordinates of the vertices of each figure after the given transformation. Then graph the reflection.

11) rotation 90° clockwise about the origin



12) rotation 180° about the origin

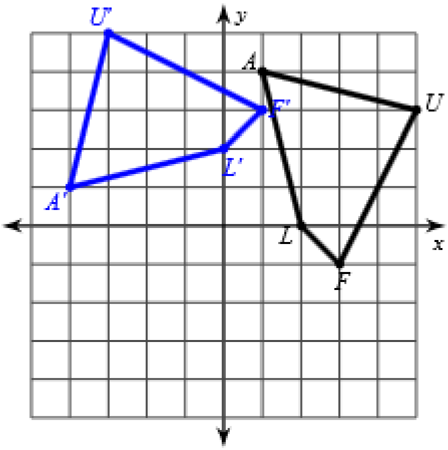


13) rotation 90° counterclockwise about the origin
$U(2, -4)$, $I(0, -1)$, $C(2, -1)$, $E(5, -3)$

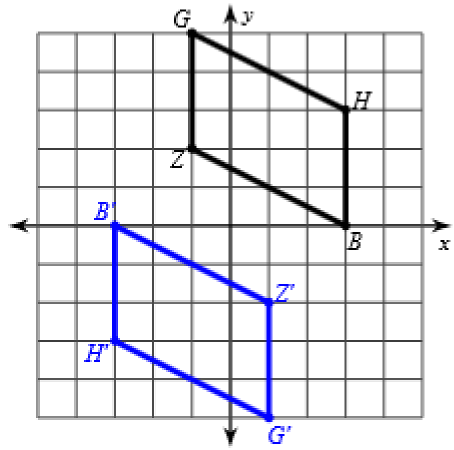
14) rotation 180° about the origin
$F(4, -3)$, $D(3, 0)$, $V(5, 0)$, $E(5, -4)$

Tell the type of rotation that describes each transformation.

15)



16)



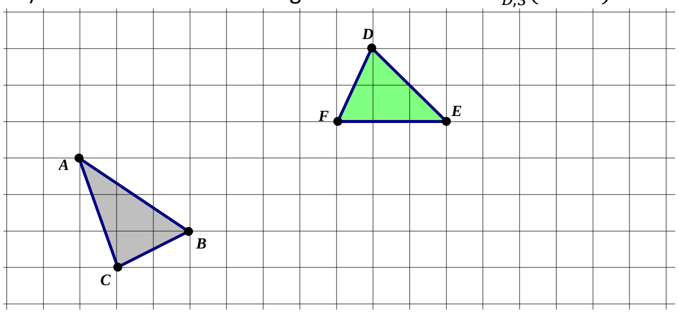
17) $F(1, 0), N(1, 3), V(2, 4), U(3, 4)$
to
$F'(-1, 0), N'(-1, -3), V'(-2, -4), U'(-3, -4)$

18) $Q(-3, 1), A(-4, 3), I(-2, 4), E(0, 4)$
to
$Q'(1, 3), A'(3, 4), I'(4, 2), E'(4, 0)$

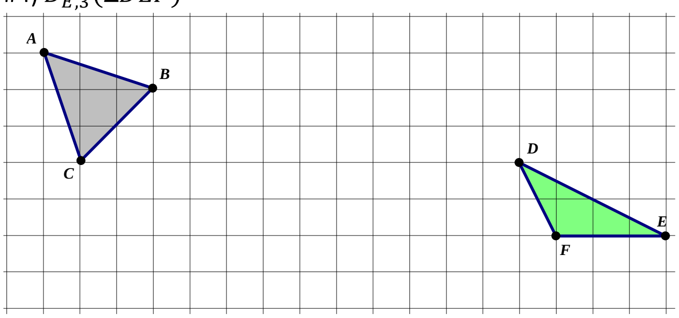
Dilations

Hw T.7

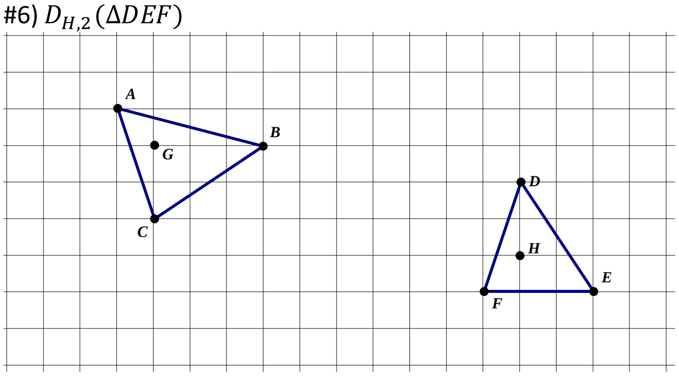
#1) Dilate ΔABC from C using a scale factor of 2. $D_{C,2}(\Delta ABC)$
#2) Dilate ΔDEF from D using a scale factor of 3. $D_{D,3}(\Delta EDF)$



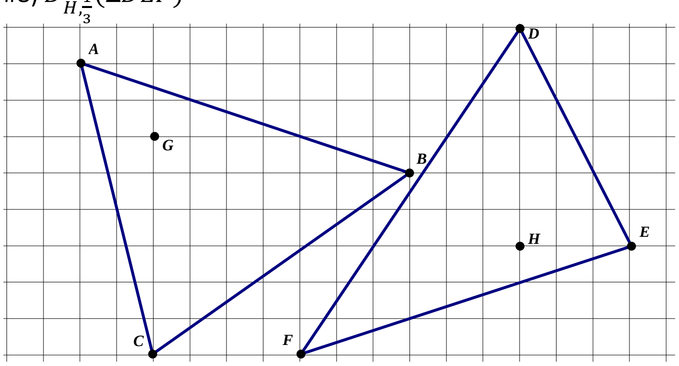
#3) $D_{A,2}(\Delta ABC)$
#4) $D_{E,3}(\Delta DEF)$



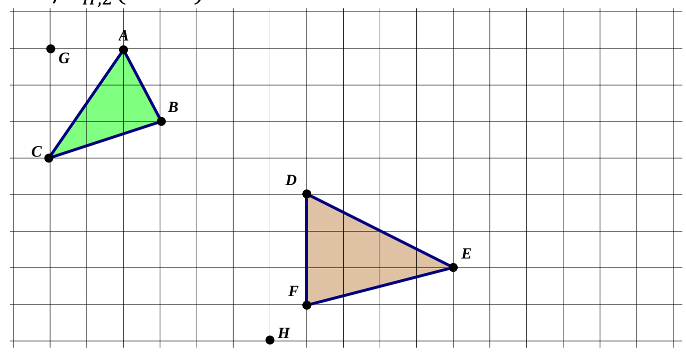
#5) $D_{G,3}(\Delta ABC)$
#6) $D_{H,2}(\Delta DEF)$



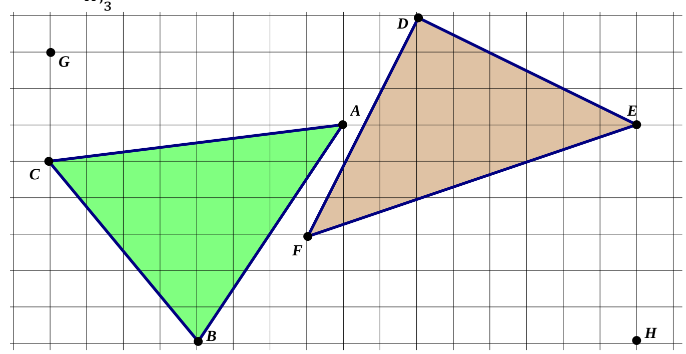
#7) $D_{G,\frac{1}{2}}(\Delta ABC)$
#8) $D_{H,\frac{1}{3}}(\Delta DEF)$



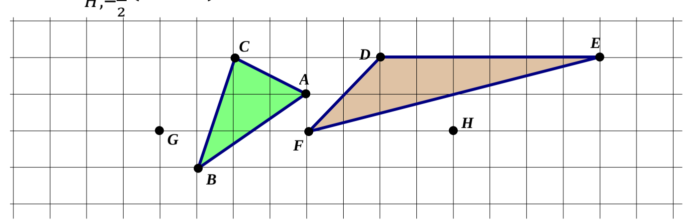
#9) $D_{G,2}(\Delta ABC)$
#10) $D_{H,2}(\Delta DEF)$



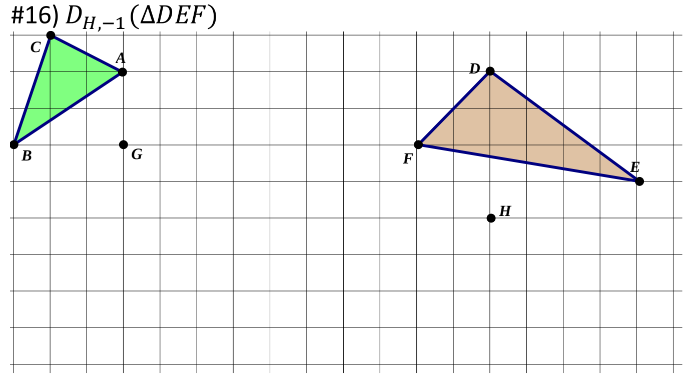
#11) $D_{G,\frac{1}{2}}(\Delta ABC)$
#12) $D_{H,\frac{1}{3}}(\Delta DEF)$



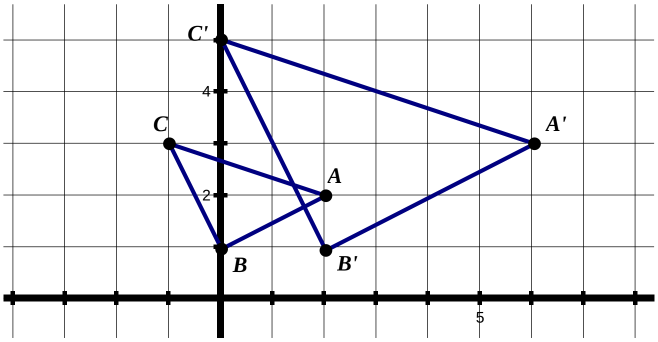
#13) $D_{G,-1}(\Delta ABC)$
#14) $D_{H,-\frac{1}{2}}(\Delta DEF)$



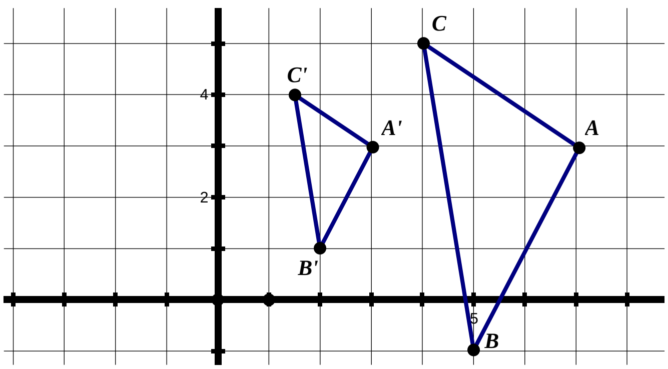
#15) $D_{G,-2}(\Delta ABC)$
#16) $D_{H,-1}(\Delta DEF)$



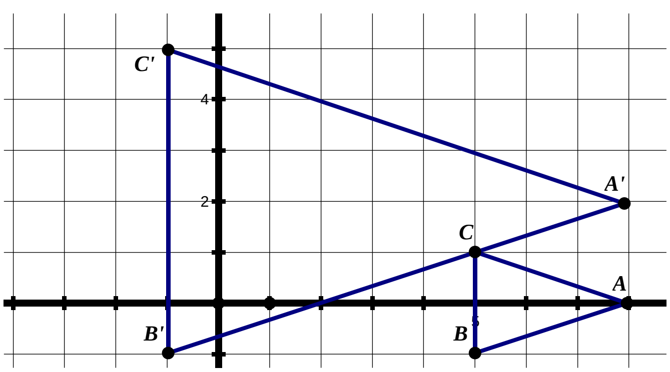
#17) Center (______ , _______) Scale Factor = _____



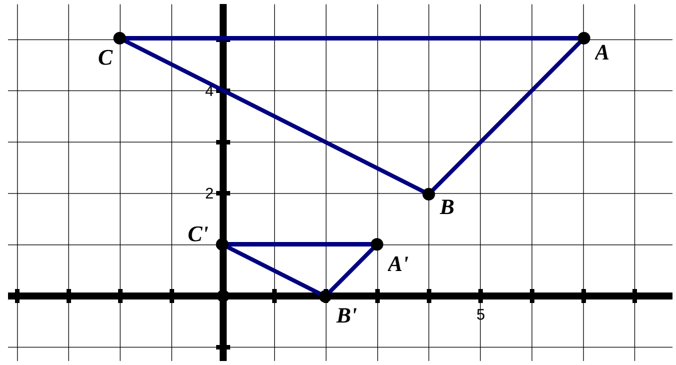
#18) Center (______ , _______) Scale Factor = _____



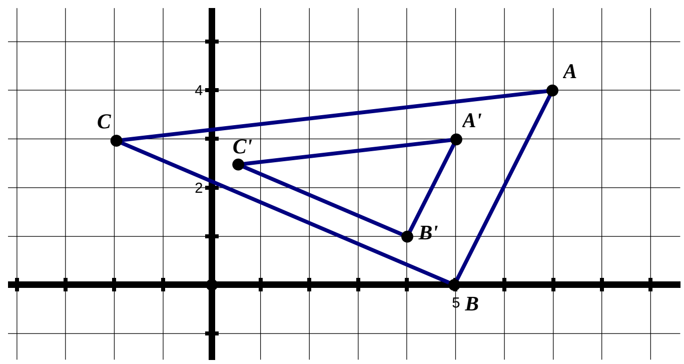
#19) Center (______ , _______) Scale Factor = _____



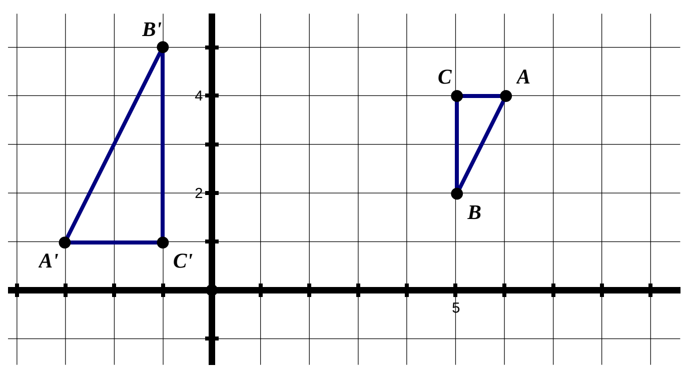
#20) Center (______ , _______) Scale Factor = _____



#21) Center (______ , _______) Scale Factor = _____



#22) Center (______ , _______) Scale Factor = _____



Complete all the problems. Write all your answers in slope-intercept form.

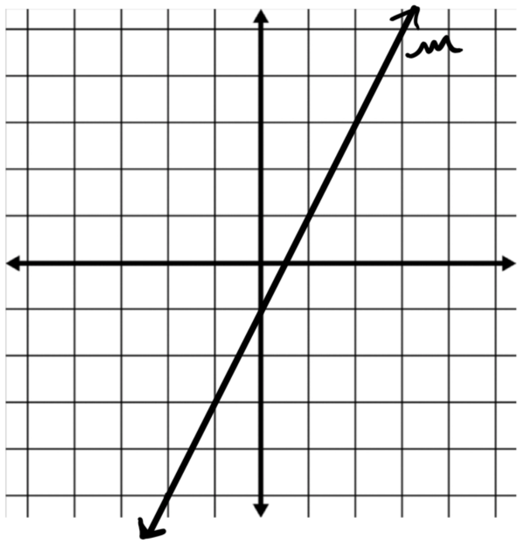
#23) Line l has the equation $y = \frac{-1}{4}x - 4$. Write the equation of the image of l after dilation with a scale factor of $\frac{1}{4}$, centered at the origin.

#24) Line l has the equation $y = 5x - 5$. Write the equation of the image of l after dilation with a scale factor of $\frac{1}{5}$, centered at the origin.

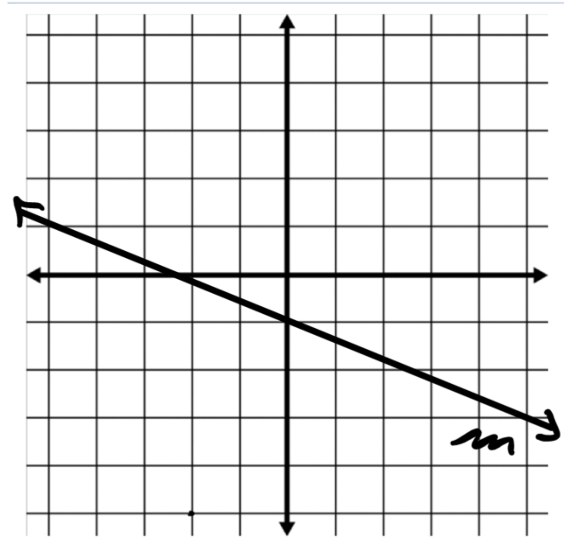
#25) Line l has the equation $y = \frac{-1}{4}x - 3$. Write the equation of the image of l after dilation with a scale factor of 2, centered at the origin.

#26) Line l has the equation $y = \frac{1}{4}x - 2$. Write the equation of the image of l after dilation with a scale factor of $\frac{1}{2}$, centered at the origin.

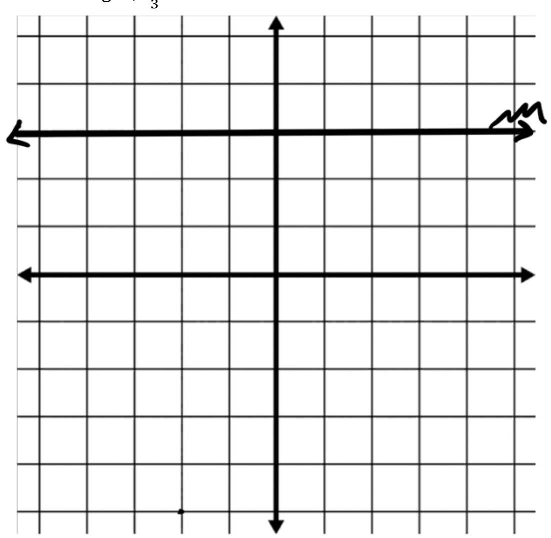
#27) $D_{origin,5}(m) = m'$



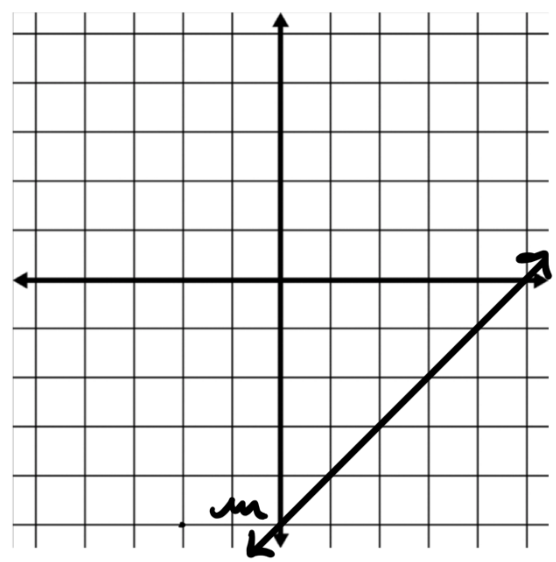
#29) $D_{origin,4}(m) = m'$



#28) $D_{origin,-\frac{1}{3}}(m) = m'$



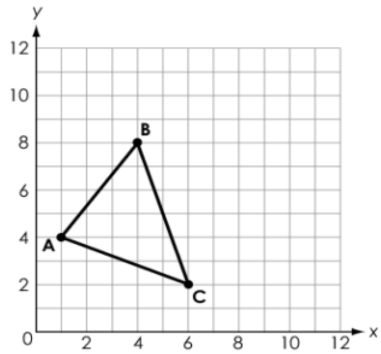
#30) $D_{origin,\frac{1}{5}}(m) = m'$



End of Course Test Questions

Question 6

Triangle ABC is shown.



Triangle $A'B'C'$ is created by dilating triangle ABC by a scale factor of 4.

What is the length of $\overline{A'B'}$?

Question 8

A figure is fully contained in Quadrant II. The figure is transformed as shown.

- a reflection over the x-axis
- a reflection over the line $y = x$
- a 90° counterclockwise rotation about the origin

In which quadrant does the resulting image lie?

Ⓐ Quadrant I

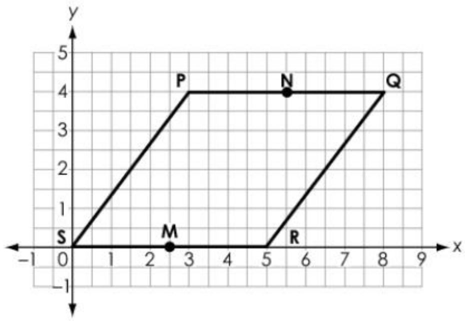
Ⓑ Quadrant II

Ⓒ Quadrant III

Ⓓ Quadrant IV

Question 12

Rhombus PQRS is shown on the coordinate plane. Points M and N are midpoints of their respective sides.



Select all of the transformations that map the rhombus onto itself.

- ☐ a 90° clockwise rotation around the center of the rhombus
- ☐ a 180° clockwise rotation around the center of the rhombus
- ☐ a reflection across $\overline{PR}$
- ☐ a reflection across $\overline{NM}$
- ☐ a reflection across $\overline{QS}$

Question 45

The equation of a line is shown.

$6x - 3y = 5$

A dilation centered at the origin with a scale factor of 6 is applied to this line.

A. What is the slope of the line after the dilation?

B. What is the value of the y-intercept of the line after the dilation?

A. ☐

B. ☐

Question 47

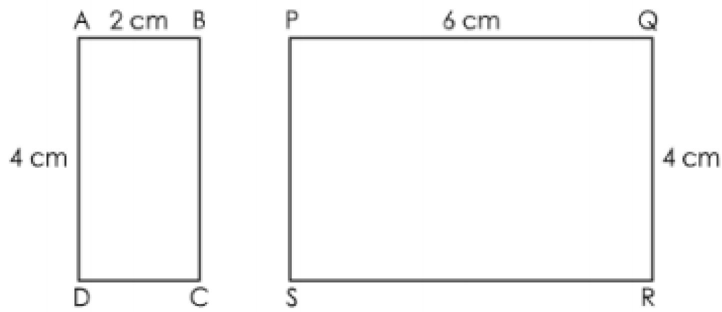
Triangle MNO is transformed to produce triangle PQR.

Select all of the transformations that would guarantee triangles MNO and PQR are congruent.

- ☐ a dilation, then a translation
- ☐ a reflection, then a dilation
- ☐ a reflection, then a rotation
- ☐ a rotation, then a translation
- ☐ a translation, then a reflection

Question 30

Consider the two rectangles shown.



Complete the sentence to determine whether the rectangles are similar.

Rectangle ABCD [ ] similar to rectangle PQRS because [ ], so rectangle ABCD [ ] dilated to fit exactly over rectangle PQRS.

Drop down choices

Rectangle ABCD [ ] similar to rectangle PQRS because [ ], so

- is
- is not

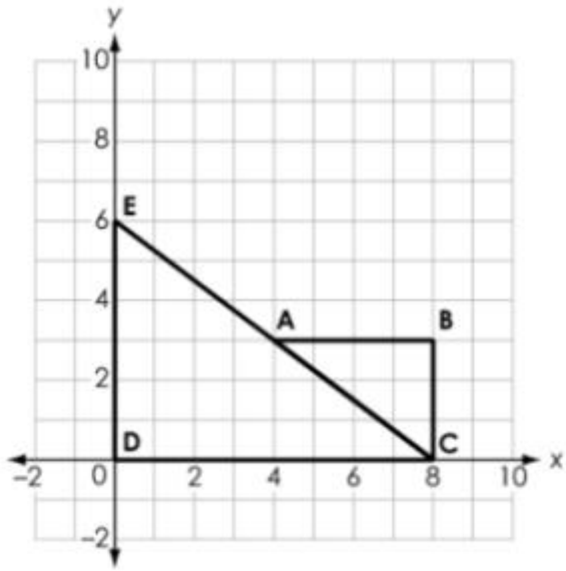
- all rectangles are similar
- all quadrilaterals are similar
- their corresponding sides are congruent
- their corresponding sides are not congruent
- their corresponding sides are proportional
- their corresponding sides are not proportional

rectangle ABCD [ ] dilated to fit exactly over rectangle PQRS.

- can be
- cannot be

Question 33

Two triangles are shown on a coordinate grid.



Katie shows that the two triangles are similar by performing the following transformations:

- First, she rotates $\triangle ABC$ $180°$ about point A.
- Then, she dilates $\triangle A'B'C'$ by a factor of k with a center of dilation at point A.
- Finally, she translates $\triangle A''B''C''$ p units to the right and q units down to map onto $\triangle CDE$.

What are the values of k, p, and q?

$k =$

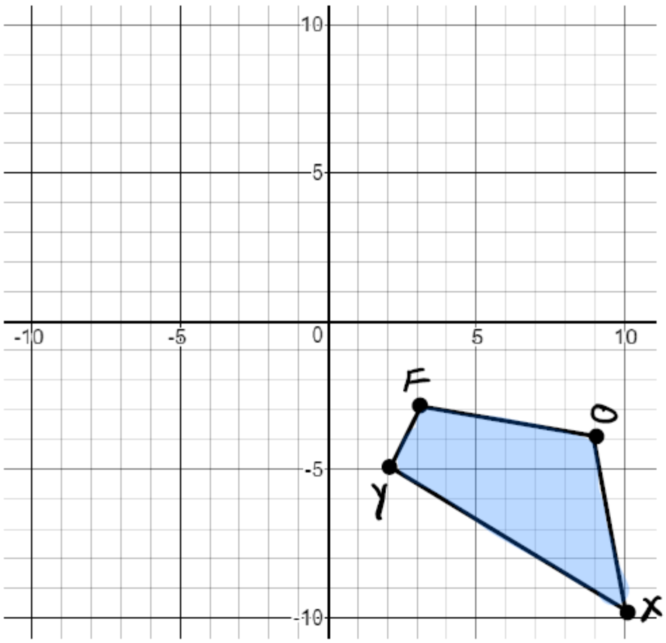
$p =$

$q =$

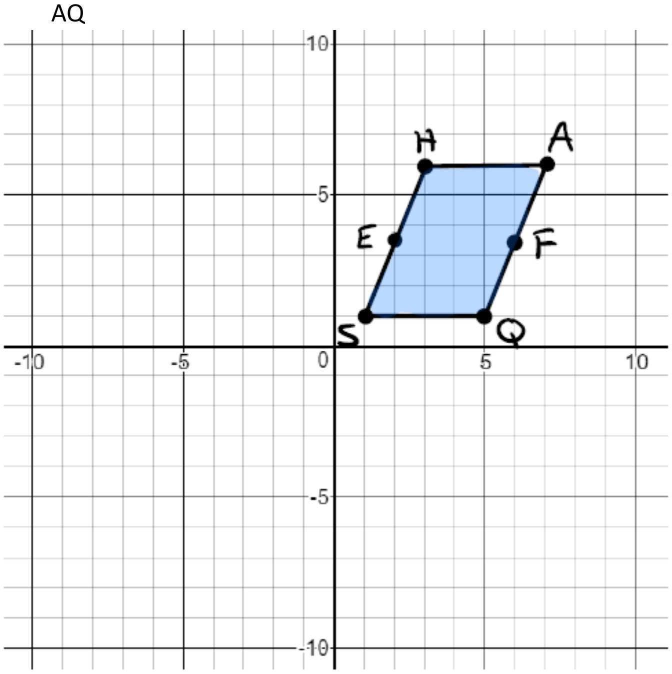
Transformations

Hw Review 1

1. Reflect FOXY across line y = x.



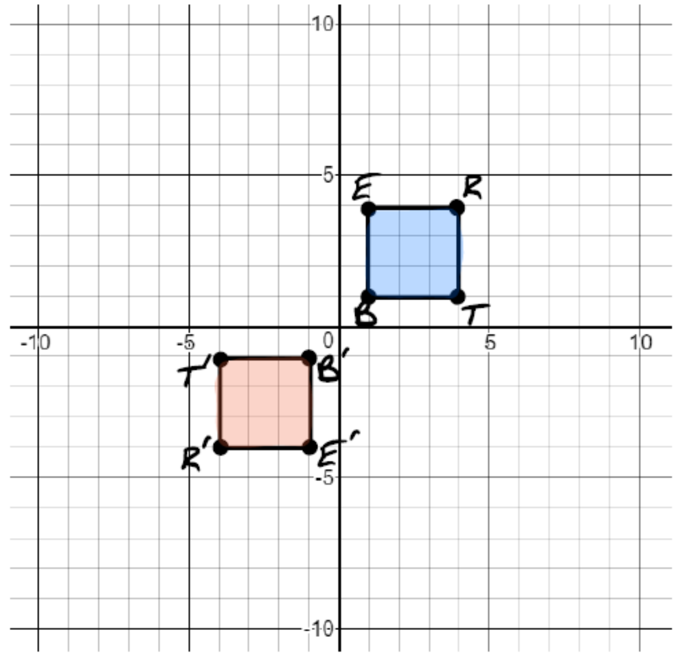
2. Parallelogram SHAQ is shown. Point E is the midpoint of segment SH. Point F is the midpoint of segment AQ



Which transformation carries the parallelogram onto itself?

E) A reflection across line segment SA
F) A reflection across line segment EF
G) A rotation of 180 degrees clockwise about the origin
H) A rotation of 180 degrees clockwise about the center of the parallelogram.

3. Square BERT is transformed to create the image B'E'R'T', as shown.



Select all of the transformations that could have been performed.

F) A reflection across the line y = x
G) A reflection across the line y = -2x
H) A rotation of 180 degrees clockwise about the origin
I) A reflection across the x-axis, and then a reflection across the y-axis.
J) A rotation of 270 degrees counterclockwise about the origin, and then a reflection across the x-axis.

4. Smelly Kid performs a transformation on a triangle. The resulting triangle is similar but not congruent to the original triangle. Which transformation did Smelly Kid perform on the triangle?

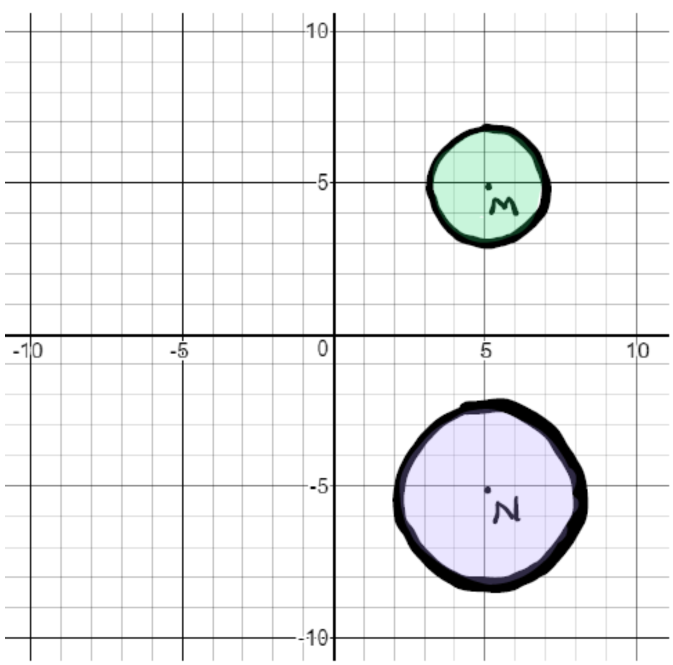
E) Dilation
F) Reflection
G) Rotation
H) Translation

5. Triangle ABC had vertices of A(1, 1), B(2.5, 3) and C(0, -3). It is dilated by a scale factor of ½ about the origin to create triangle A'B'C'. What is the length, in units, of side $\overline{B'C'}$?

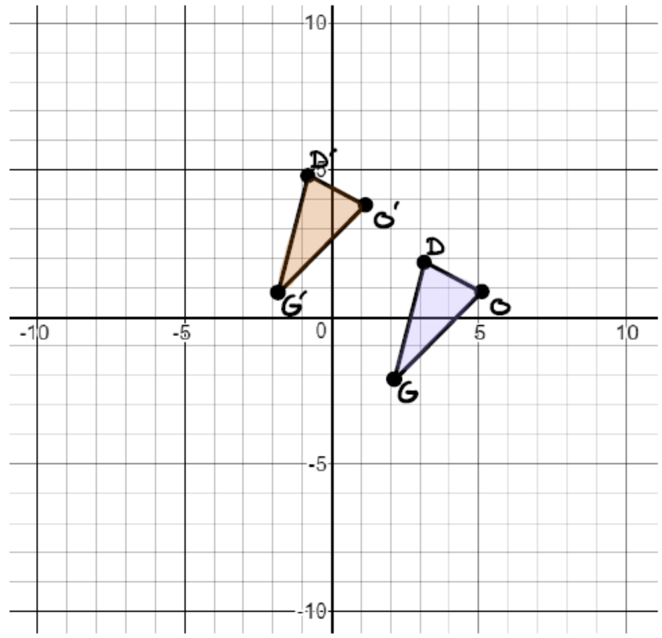
6. Complete the statement to explain how it can be shown that two circles are similar.
Circle M can be mapped onto circle N by a reflection

across ________________________ and a dilation about the center of circle M by a scale factor of

____



7. A translation is applied to ΔDOG to create $\Delta D'O'G'$.

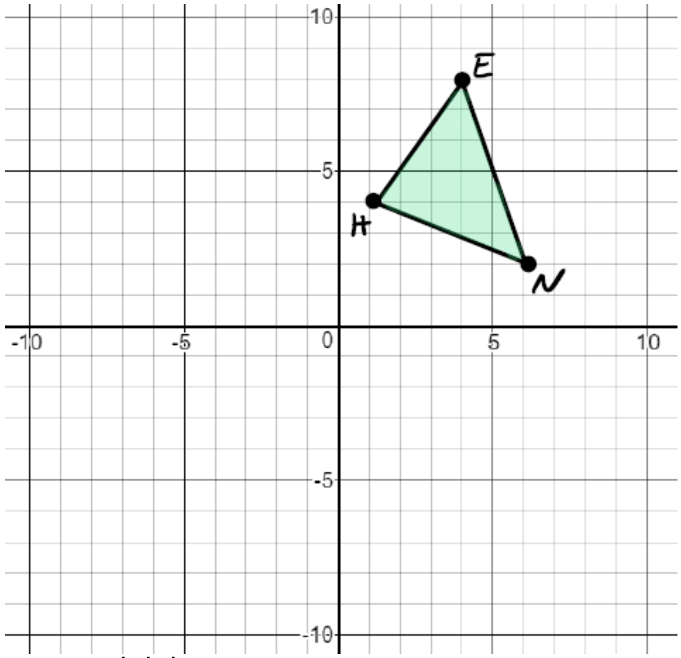


Let the statement $(x, y) \rightarrow (a, b)$ describe the translation. Create equations for *a* in terms of *x* and for *b* in terms of *y* that could be used to describe the translation.

a = _________________________

b = _________________________

8. Triangle HEN is shown.



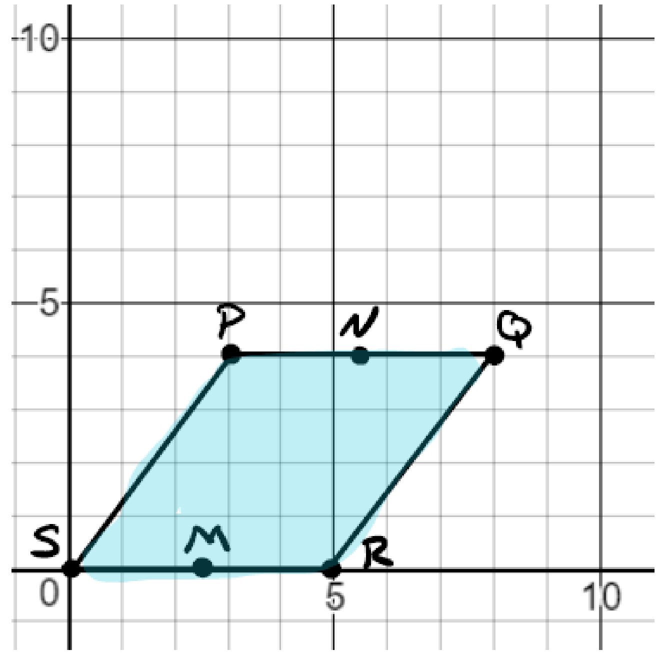
Triangle $H'E'N'$ is created by dilating triangle HEN by a scale factor of 4. What is the length of $\overline{H'E'}$?

9. A figure is fully contained in Quadrant II. The figure is transformed as shown.
   - A reflection over the x-axis
   - A reflection over the line y = x
   - A $90°$ counterclockwise rotation about the origin.

In which quadrant does the resulting image lie?

E) Quadrant I
F) Quadrant II
G) Quadrant III
H) Quadrant IV

10. Rhombus PQRS is shown in the coordinate plane. Points M and N are midpoints of their respective sides.



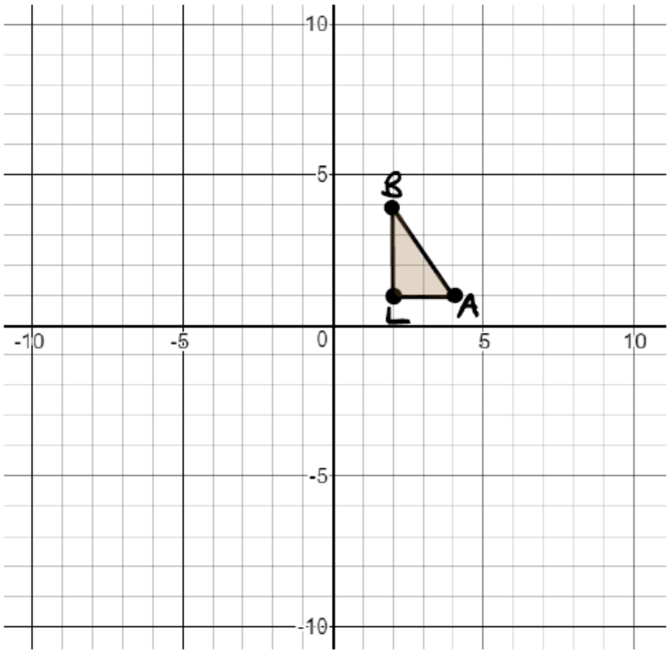
Select all of the transformations that map the rhombus onto itself.

E) A $90°$ clockwise rotation around the center of the rhombus
F) A $180°$ clockwise rotation around the center of the rhombus
G) A reflection across $\overline{NM}$
H) A reflection across $\overline{QS}$

11. Triangle ABC is reflected across the line y = 2x to form triangle RST. Select all of the true statements.

G) $\overline{AB} = \overline{RS}$ (I know this notation is wrong, but some moron used this wrong notation on the state test.)
H) $\overline{AB} = 2 \cdot \overline{RS}$ (I know this notation is wrong, but some moron used this wrong notation on the state test.)
I) $\Delta ABC \sim \Delta RST$
J) $\Delta ABC \cong \Delta RST$
K) $m\angle BAC = m\angle SRT$
L) $m\angle BAC = 2 \cdot m\angle SRT$

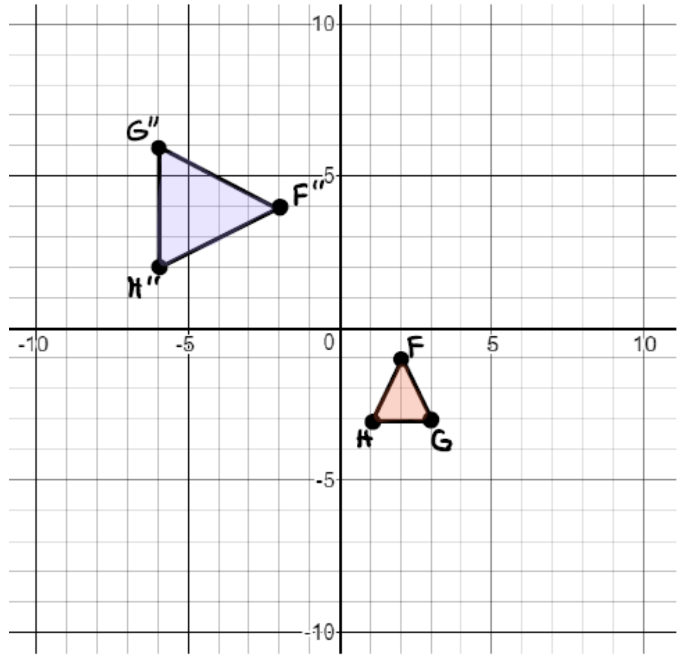
12. Triangle BAL is reflected across the line y = x. Draw the resulting triangle.



13. All corresponding sides and angles of ΔRST and ΔDEF are congruent. Select all of the statements that must be true.

F) There is a reflection that maps $\overline{RS}$ to $\overline{DE}$
G) There is a dilation that maps ΔRST to ΔDEF
H) There is a translation followed by a rotation that maps $\overline{RT}$ to $\overline{DF}$
I) There is a sequence of transformations that maps ΔRST to ΔDEF
J) There is not necessarily a sequence of rigid motions that maps ΔRST to ΔDEF

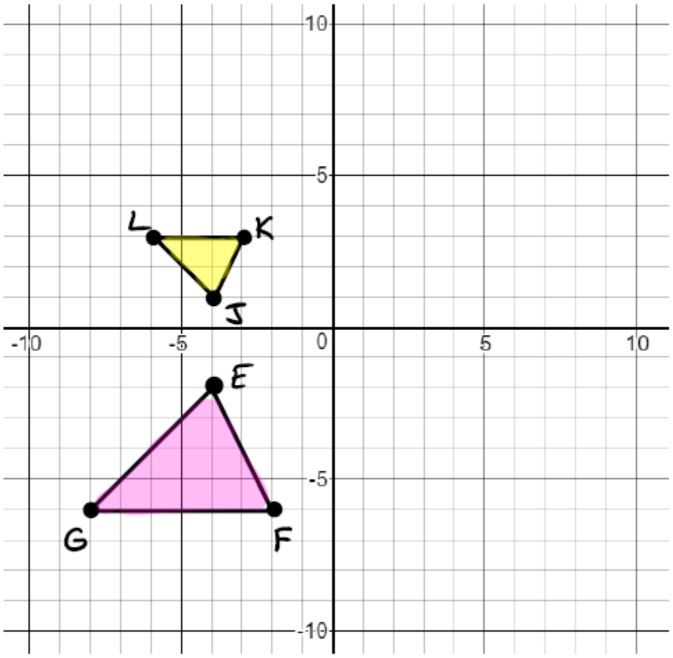
14. The coordinate plane shows ΔFGH and $\Delta F''G''H''$



Which sequence of transformations can be used to show that $\Delta FGH \sim \Delta F''G''H''$?

E) A dilation about the origin with a scale factor of 2, followed by a $180°$ clockwise rotation about the origin.
F) A dilation about the origin with a scale factor of 2, followed by a reflection over the line y = x
G) A translation 5 units up and 4 units left, followed by a dilation with a scale factor of ½ about point F”
H) A $180°$ clockwise rotation about the origin, followed by a dilation with a scale factor of ½ about F”

15. Two triangles are shown.



Which sequence of transformations could be performed on ΔEFG to show that it is similar to ΔJKL?

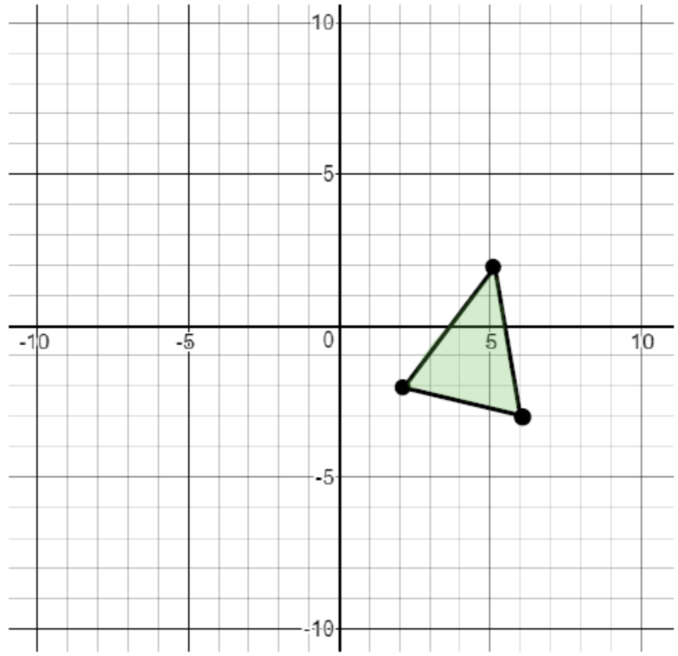
E) Rotate ΔEFG $90°$ clockwise about the origin, and then dilate it by a scale factor of ½ with a center of dilation at point F'

F) Rotate ΔEFG $180°$ clockwise about point E, and then dilate it by a scale factor of 2 with a center of dilation at point E'

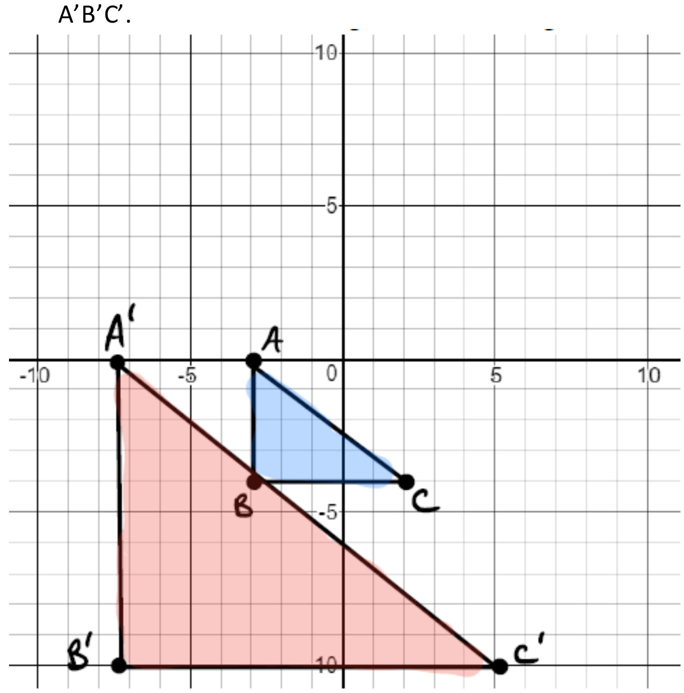
G) Translate ΔEFG 1 unit up, then reflect it across the x-axis, and then dilate it by a factor of ½ with a center of dilation at point E"

H) Reflect ΔEFG across the x-axis, then reflect it across the line y = x, and then dilate it by a scale factor of 2 with a center of dilation at point F"

16. A triangle is shown on the coordinate grid. Draw the triangle after a transformation following the rule $(x, y) \rightarrow (x - 4, y + 3)$



17. Triangle ABC is dilated with a scale factor of k and a center of dilation at the origin to obtain triangle A'B'C'.



What is the scale factor?

18. A square is rotated about its center. Select all of the angles of rotation that will map the square onto itself.

    G) 45 degrees
    H) 60 degrees
    I) 90 degrees
    J) 120 degrees
    K) 180 degrees
    L) 270 degrees

19. Circle J is located in the first quadrant with center (a, b) and radius s. Felipe transforms Circle J to prove that it is similar to any circle centered at the origin with radius t. Which sequence of transformations did Felipe use?

    E) Translate Circle J by $(x + a, y + b)$ and dilate by a factor of $\frac{t}{s}$
    F) Translate Circle J by $(x + a, y + b)$ and dilate by a factor of $\frac{s}{t}$
    G) Translate Circle J by $(x - a, y - b)$ and dilate by a factor of $\frac{t}{s}$
    H) Translate Circle J by $(x - a, y - b)$ and dilate by a factor of $\frac{s}{t}$

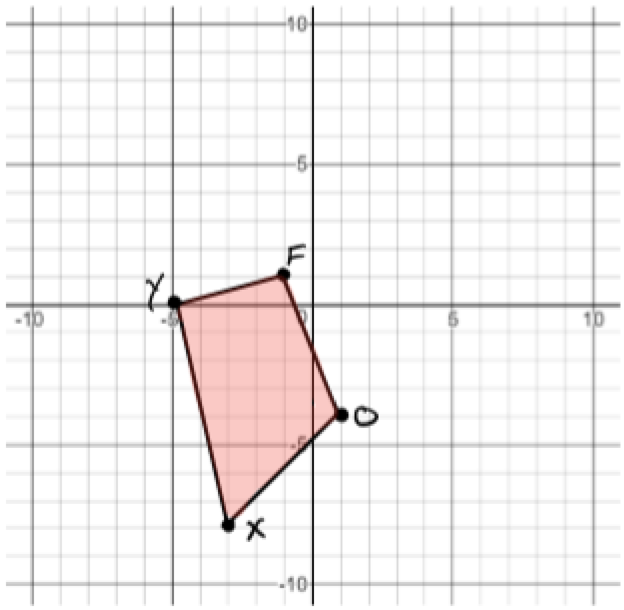
20. ______Kyle performs a transformation on a triangle. The resulting is similar but not congruent to the original triangle. Which transformation did Kyle use?

    A) Dilation
    B) Reflection
    C) Rotation
    D) Translation

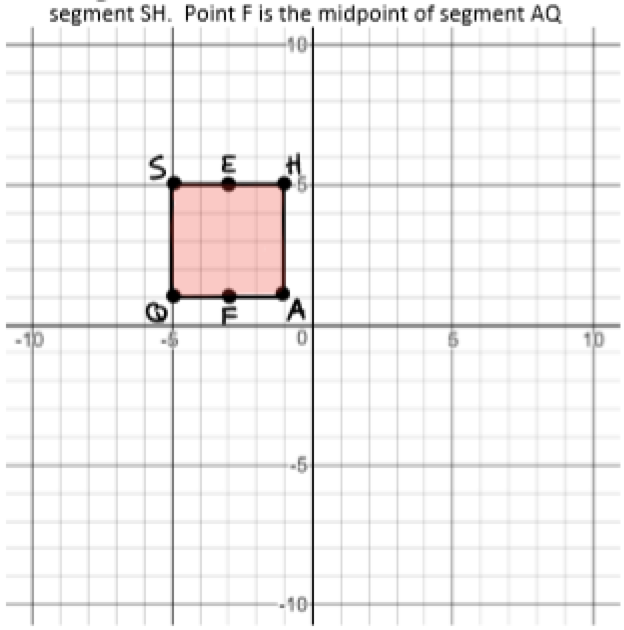
Transformations

Hw Review 2

1) Reflect FOXY across line y = x.



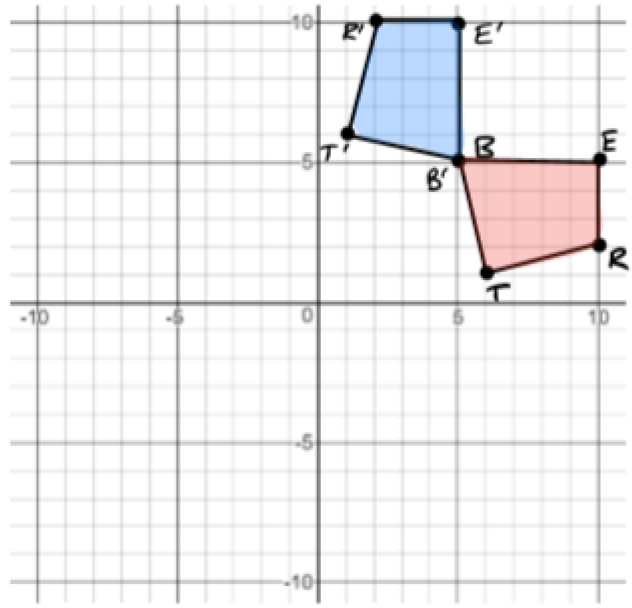
2) Square SHAQ is shown. Point E is the midpoint of segment SH. Point F is the midpoint of segment AQ



Which transformation carries the Square onto itself?

A) A reflection across line segment SA
B) A reflection across line segment EF
C) A rotation of 180 degrees clockwise about the origin
D) A rotation of 180 degrees clockwise about the center of the Square.

3) Square BERT is transformed to create the image B'E'R'T', as shown.



Select all of the transformations that could have been performed.

A) A reflection across the line y = x
B) A reflection across the line y = -2x
C) A rotation of 180 degrees clockwise about the origin
D) A reflection across the x-axis, and then a reflection across the y-axis.
E) A rotation of 270 degrees counterclockwise about the origin, and then a reflection across the x-axis.

4) Jose performs a transformation on a rhombus The resulting triangle is similar but not congruent to the original triangle. Which transformation did Jose perform on the rhombus?

A) Dilation
B) Reflection
C) Rotation
D) Translation

5) Triangle ABC had vertices of A(1, 1), B(2.5, 3) and C(1, -3). It is dilated by a scale factor of 3 about the origin to create triangle A'B'C'. What is the length, in units, of side $\overline{A'C'}$?

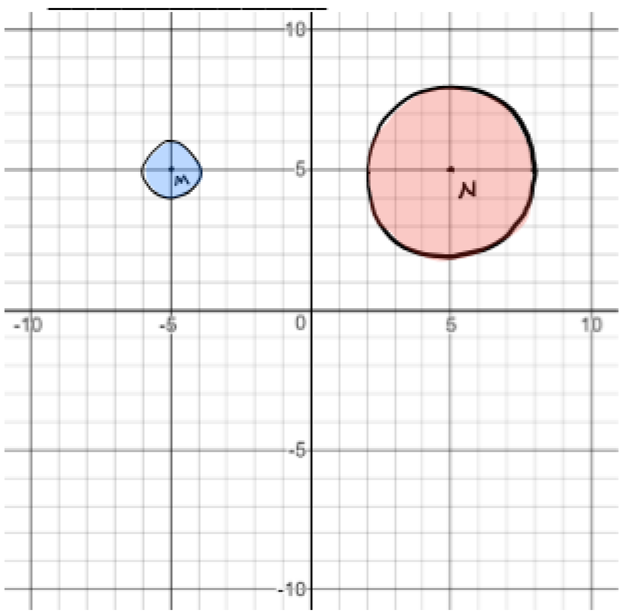
6) Complete the statement to explain how it can be shown that two circles are similar.

Circle M can be mapped onto circle N by a reflection

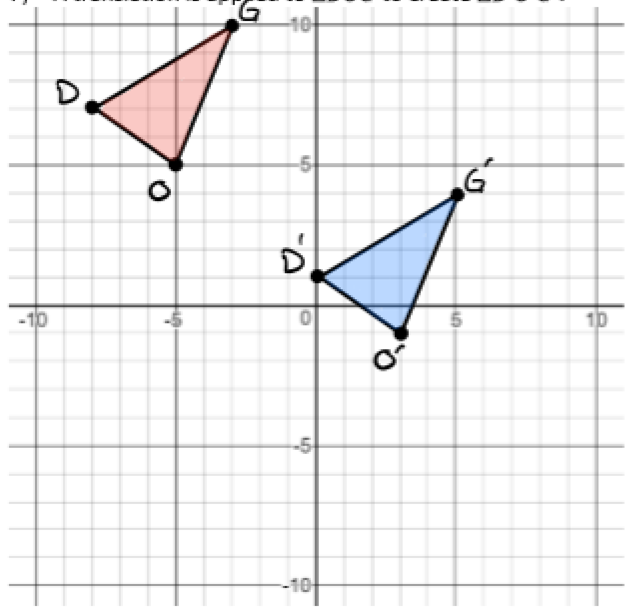
across ______________________ and a dilation

about the center of circle M by a scale factor of

____



7) A translation is applied to ΔDOG to create $\Delta D'O'G'$.

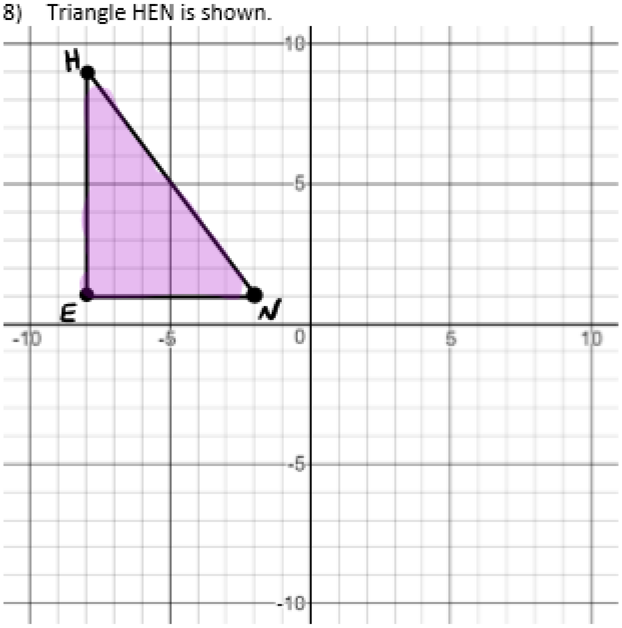


Let the statement $(x, y) \rightarrow (a, b)$ describe the translation. Create equations for *a* in terms of *x* and for *b* in terms of *y* that could be used to describe the translation.

a = ______________________

b = ______________________

8) Triangle HEN is shown.



Triangle $H'E'N'$ is created by dilating triangle HEN by a scale factor of $\frac{1}{3}$. What is the length of $\overline{H'N'}$?

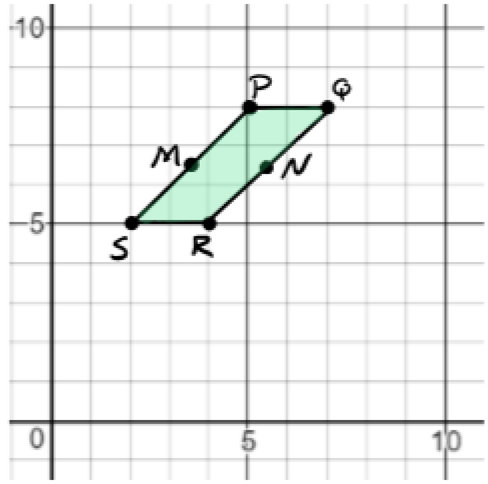
9) A figure is fully contained in Quadrant IV. The figure is transformed as shown.

- A reflection over the x-axis
- A reflection over the line y = x
- A 90° counterclockwise rotation about the origin.

In which quadrant does the resulting image lie?

A) Quadrant I
B) Quadrant II
C) Quadrant III
D) Quadrant IV

10) Parallelogram PQRS is shown in the coordinate plane. Points M and N are midpoints of their respective sides.



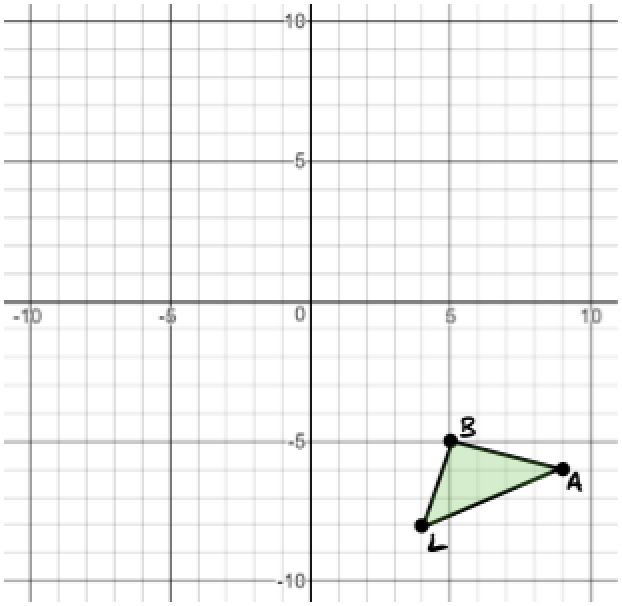
Select all of the transformations that map the parallelogram onto itself.

A) A 90° clockwise rotation around the center of the parallelogram
B) A 180° clockwise rotation around the center of the parallelogram
C) A reflection across $\overline{PR}$
D) A reflection across $\overline{NM}$
E) A reflection across $\overline{QS}$

11) Triangle ABC is reflected across the x-axis to form triangle RST. Select all of the true statements.

A) $\overline{AB} = \overline{RS}$ (I know this notation is wrong, but some moron used this wrong notation on the state test.)
B) $\overline{AB} = 2 \cdot \overline{RS}$ (I know this notation is wrong, but some moron used this wrong notation on the state test.)
C) $\Delta ABC \sim \Delta RST$
D) $\Delta ABC \cong \Delta RST$
E) $m\angle BAC = m\angle SRT$
F) $m\angle BAC = 2 \cdot m\angle SRT$

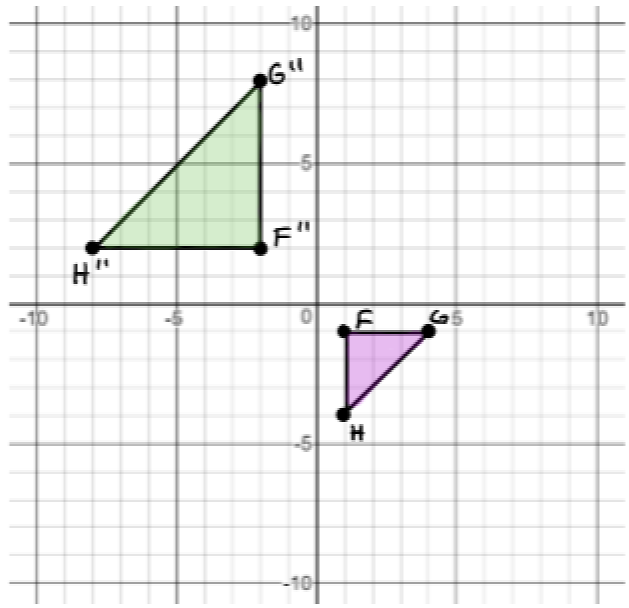
12) Triangle BAL is reflected across the line y = x. Draw the resulting triangle.



13) All corresponding sides and angles of ΔRST and ΔDEF are congruent.
Select all of the statements that must be true.

A) There is a reflection that maps $\overline{RS}$ to $\overline{DE}$
B) There is a dilation that maps ΔRST to ΔDEF
C) There is a translation followed by a rotation that maps $\overline{RT}$ to $\overline{DF}$
D) There is a sequence of transformations that maps ΔRST to ΔDEF
E) There is not necessarily a sequence of rigid motions that maps ΔRST to ΔDEF

14) The coordinate plane shows ΔFGH and $\Delta F''G''H''$



Which sequence of transformations can be used to show that $\Delta FGH \sim \Delta F''G''H''$?

A) A dilation about the origin with a scale factor of 2, followed by a 180° clockwise rotation about the origin.
B) A dilation about the origin with a scale factor of 2, followed by a reflection over the line y = x
C) A translation 5 units up and 4 units left, followed by a dilation with a scale factor of ½ about point F"
D) A 180° clockwise rotation about the origin, followed by a dilation with a scale factor of ½ about F"

15) Two triangles are shown.

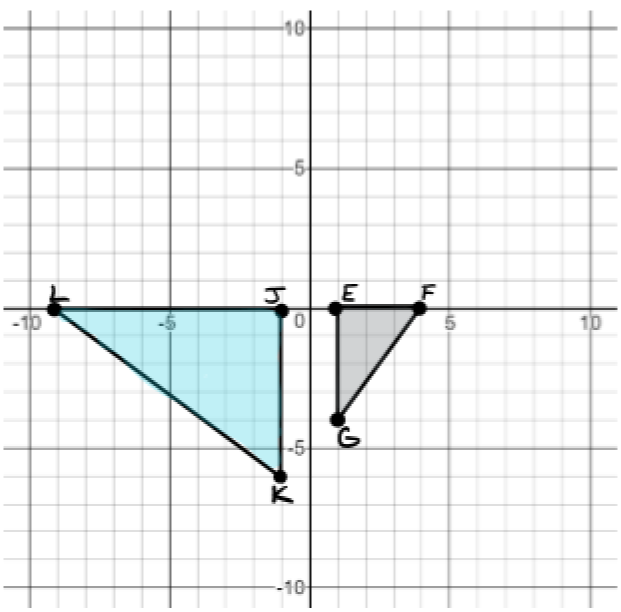
Which sequence of transformations could be performed on ΔEFG to show that it is similar to ΔJKL?

A) Rotate ΔEFG 90° clockwise about the origin, and then dilate it by a scale factor of ½ with a center of dilation at point F'

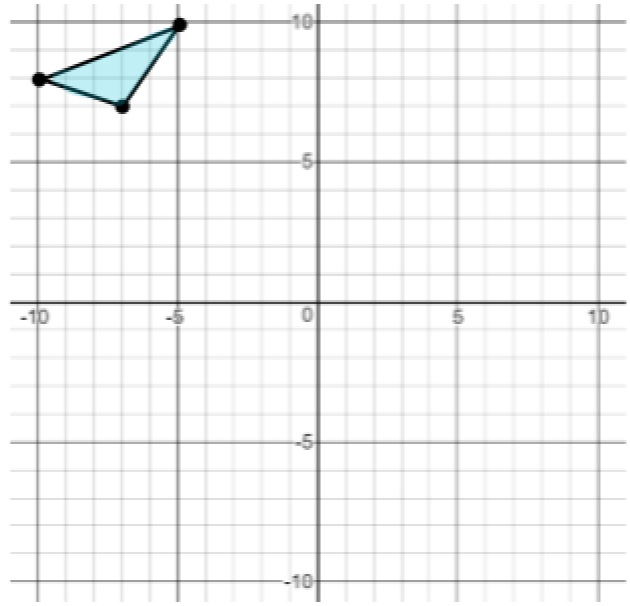
B) Rotate ΔEFG 180° clockwise about point E, and then dilate it by a scale factor of 2 with a center of dilation at point E'

C) Translate ΔEFG 1 unit up, then reflect it across the x-axis, and then dilate it by a factor of ½ with a center of dilation at point E"

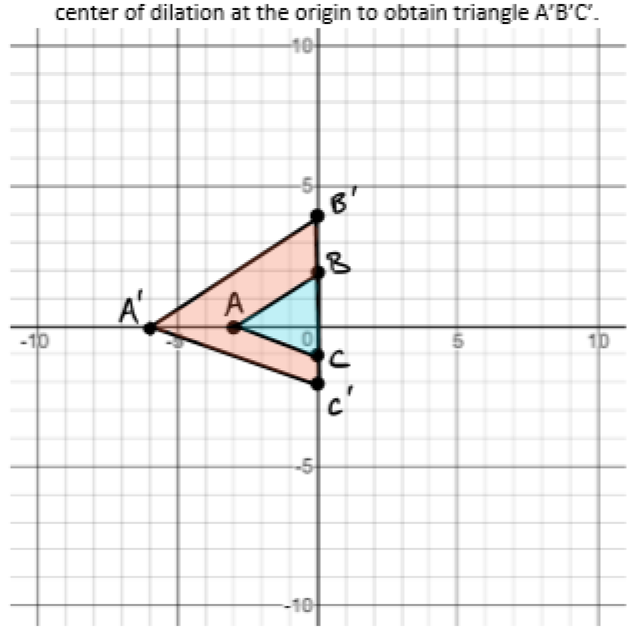
D) Reflect ΔEFG across the x-axis, then reflect it across the line y = x, and then dilate it by a scale factor of 2 with a center of dilation at point F"



16) A triangle is shown on the coordinate grid. Draw the triangle after a transformation following the rule $(x, y) \rightarrow (x+5, y-2)$



17) Triangle ABC is dilated with a scale factor of k and a center of dilation at the origin to obtain triangle A'B'C'.



What is the scale factor?

18) An equilateral triangle is rotated about its center.

Select all of the angles of rotation that will map the equilateral triangle onto itself.

A) 60 degrees
B) 120 degrees
C) 180 degrees
D) 240 degrees
E) 300 degrees
F) 360 degrees

19) Circle R is located in the first quadrant with center (x_1, y_1) and radius f. Felipe transforms Circle R to prove that it is similar to any circle centered at the origin with radius e.

Which sequence of transformations did Felipe use?

A) Translate Circle R by $(x + x_1, y + y_1)$ and dilate by a factor of $\frac{e}{f}$
B) Translate Circle R by $(x + x_1, y + y_1)$ and dilate by a factor of $\frac{f}{e}$
C) Translate Circle R by $(x - x_1, y - y_1)$ and dilate by a factor of $\frac{e}{f}$
D) Translate Circle R by $(x - x_1, y - y_1)$ and dilate by a factor of $\frac{f}{e}$