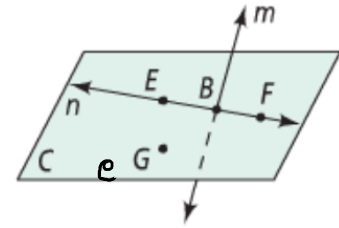


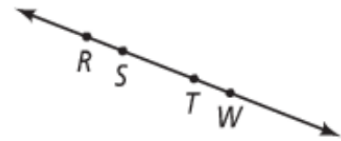
Points, Lines & Planes

Hw Section 1.1

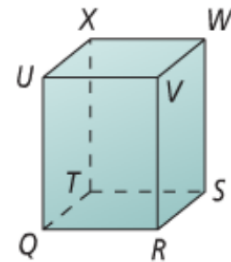
1. What are two other ways to name \overleftrightarrow{EF} ?
2. What are two other ways to name plane **C**?
3. Name three collinear points.
4. Name four coplanar points.



5. Name the segments in the figure.
6. Name the rays in the figure with endpoint S.
7. Name the pair of opposite rays with endpoint T.
8. Name another pair of opposite rays.



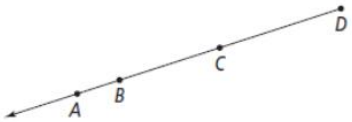
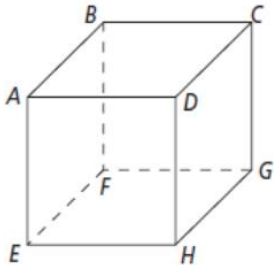
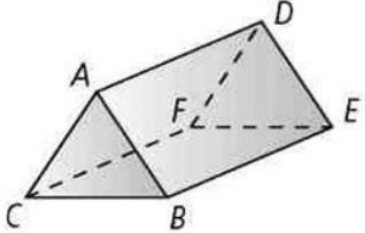
9. Name the intersection of planes QRS and RSW .
10. Name the intersection of planes TXW and UQX .
11. Name two planes that intersect at \overleftrightarrow{QU} .
12. Name two planes that intersect at \overleftrightarrow{VW} .
13. Draw an arrow to the plane that contains the points R, V, W .

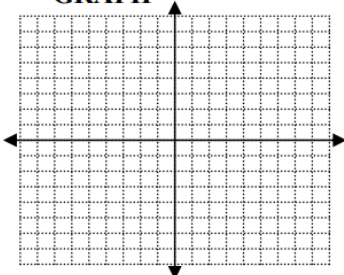
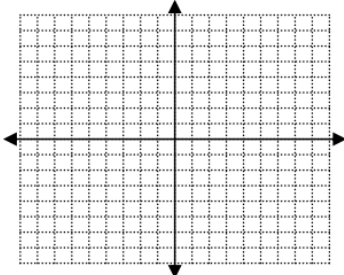
**Draw the following:**

14. four collinear points

15. \overleftrightarrow{MA} 16. \overleftrightarrow{ET} on plane **D**

17. four noncoplanar points

WHO IS RIGHT?!	
Mr. Brust and Mr. Sullivan are arguing about who is correct. Help them settle each argument by explaining who, if anyone, is right. Each argument has an included picture to the right.	
<p>18.</p> <ul style="list-style-type: none"> Mr. Brust says “picture is called \overrightarrow{DB}” Sully says “picture is called \overrightarrow{BD}” <p>Who is correct, if anyone? Why?</p>	
<p>19.</p> <ul style="list-style-type: none"> Mr. Brust says “intersection of plane ABC and plane CDH is point C” Sully says “intersection of plane ABC and plane CDH is point D” <p>Who is correct, if anyone? Why?</p>	
<p>20.</p> <ul style="list-style-type: none"> Mr. Brust says “\overline{AB} and point D are coplanar” Sully says “\overline{AB} and point C are coplanar” <p>Who is correct, if anyone? Why?</p>	

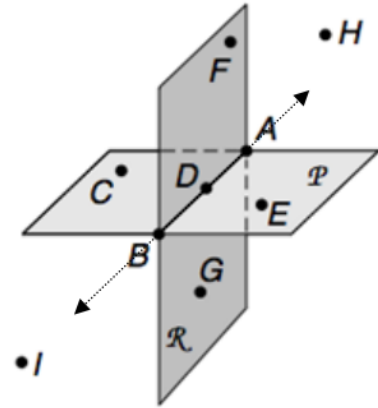
ALGEBRA REVIEW		
<p>SOLVE</p> $\frac{x}{3} - 5 = -7$	<p>GRAPH</p> $y = \frac{3}{4}x - 2$ 	<p>MULTIPLY (distribute)</p> $5(2x - 3)$
<p>SOLVE</p> $3x + 2 = 5x - 8$	<p>GRAPH</p> $y = -4$ 	<p>FACTOR Factor out the greatest common factor (undistribute)</p> $4x^2 - 12$

Points, Lines & Planes

Application Section 1.1

Use the figure at the right to answer 1 and 4

1. Where do plane \mathcal{R} and plane \mathcal{P} intersect?
2. Name plane \mathcal{R} another way.
3. Name three collinear points.
4. Name \overrightarrow{BA} another way.

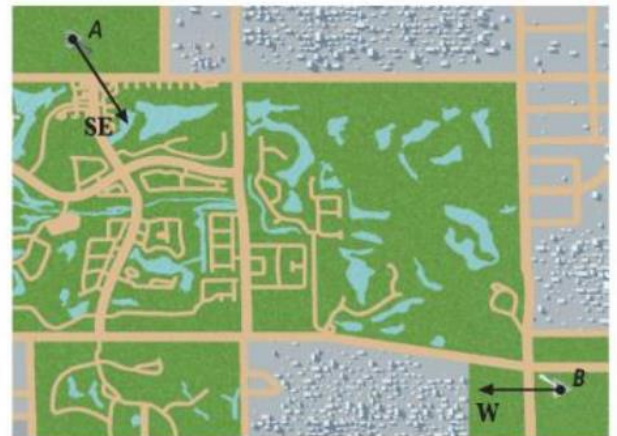


Watch the application walk through video if you need extra help getting started on Flippedmath.com

5. MAP

Mr. Kelly gets lost walking home from work one day. He calls his mommy for help on his cell phone. A cell phone tower at point A receives his cell phone signal from the Southeast as shown on the map. A cell phone tower at point B receives his same signal from due West as shown on the map.

- a. Help a Geometry teacher out by finding the exact location of Mr. Kelly on the map. Label it point K.
- b. Which postulate(s) help you locate Mr. Kelly?



6. Coordinate Geometry

- a. Graph the points

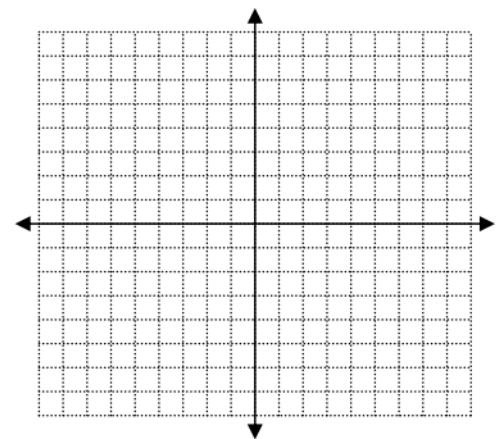
$$F(2,7)$$

$$U(-6,-5)$$

$$N(-2,4)$$

- b. State whether the three points are collinear or not.
- c. If the three points are not collinear, change the coordinate of point N to make them collinear.

$$N(\underline{\quad}, \underline{\quad})$$



7. Proofs

A two column proof logically shows why something is true. Look at the example below.

Given: $2x + 1 = 9$	
Prove: $x = 4$	
STATEMENTS	REASONS
1. $2x + 1 = 9$	1. Given
2. $2x = 8$	2. Subtraction Property of Equality
3. $x = 4$	3. Division Property of Equality

Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of _____
- _____ Postulate
- _____ Theorem

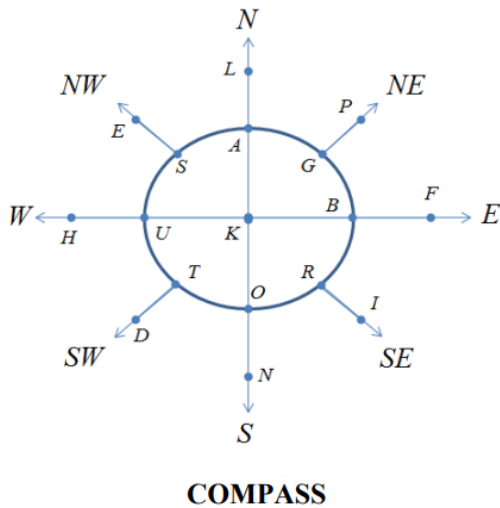
Fill in the missing reasons in the two column proof.

Given: $2(3x + 1) = 14$	
Prove: $x = 2$	
STATEMENTS	REASONS
1. $2(3x + 1) = 14$	1.
2. $6x + 2 = 14$	2.
3. $6x = 12$	3.
4. $x = 2$	4.

8. Geometric Shape

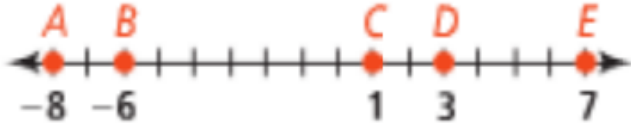
Mr. Brust buys Mr. Kelly a compass to help with his navigational skillz. Mr. Brust starts thinking about geo.

- a. Name 3 collinear points that run North to South.
- b. Name the ray that points to Northeast.
- c. How many points are on circle K ?
- d. Name \overleftrightarrow{HF} 3 different ways.
- e. What do you notice about \overline{KB} , \overline{KA} , \overline{KU} , and \overline{KO} ?



Segments, Distance & Midpoint

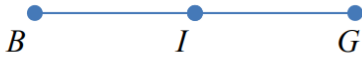
Use the picture for questions 1 – 4.



- Find AB
- Find EC
- What is the midpoint of \overline{CE} ?
- Is $\overline{BD} \cong \overline{CA}$? Explain why or why not.

Label the picture, then find the length of the given segment.

5.



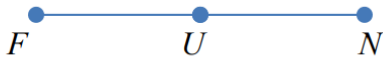
I is the midpoint of \overline{BG}

$$BI = 4y + 8$$

$$IG = 20$$

Find BI

6.



$$\overline{FU} \cong \overline{UN}$$

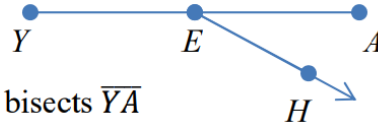
$$FU = 5x + 3$$

$$UN = 7x - 9$$

Find FU

Hw Section 1.2

7.



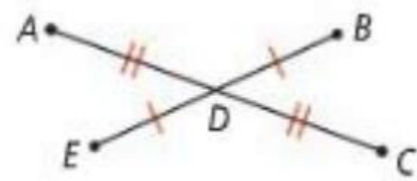
\overrightarrow{EH} bisects \overline{YA}

$$EA = 2x + 5$$

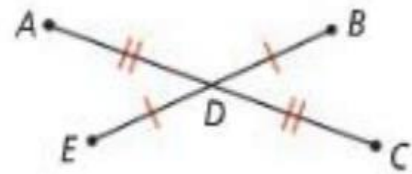
$$YE = 3x - 9$$

Find EA

- If $AD = 12$ and $AC = 4y - 36$, find the value of y . Then find DC .



- If $ED = x + 4$ and $DB = 3x - 8$, find ED and DB .



Draw and label a picture for each of the following. Indicate what line segments are congruent (if any).

- A is the midpoint of \overline{HT}

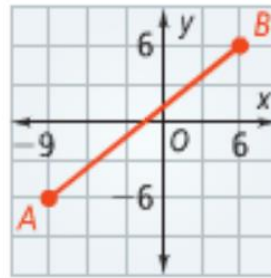
- \overline{DQ} bisects \overline{RF} at M.

- \overrightarrow{TM} bisects \overline{WE} at T

Geometry 6

Find the midpoint and distance given the two endpoints
 16. (12,15) and (-8, -22)

Find the midpoint and distance given the two endpoints
 18.



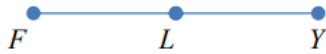
17. (-3,5) and (14, 28)

ALGEBRA REVIEW		
<p>SOLVE</p> $2 + \frac{x}{3} = 10$	<p>GRAPH</p> $y = -\frac{3}{4}x - 2$	<p>MULTIPLY (distribute)</p> $-2(2x - 3)$
<p>SOLVE</p> $3 + 2y = 5y - 9$	<p>GRAPH</p> $x = 4$	<p>FACTOR Factor out the greatest common factor (undistribute)</p> $9x^2 + 12$

Segments, Distance & Midpoint

Application Section 1.2

1. Label the picture and find the missing segment.



L is the midpoint of \overline{FY}

$$FL = 6x - 9$$

$$LY = 3x + 3$$

Find x and then find FL , LY , and FY

2. Find the distance and midpoint between the two endpoints.

$(14, -8)$ and $(4, 12)$

Watch the application walk through video if you need extra help getting started on Flippedmath.com

3. MAP

Since Mr. Kelly gets lost so easily he decides to lay a coordinate system over the map to help him navigate. Point H is Mr. Kelly's house and point N is where Mr. Kelly's favorite nail salon where he gets his manicures and pedicures.

- Find the distance between Mr. Kelly's house and his nail salon.
- Mr. Kelly always has time for a facial which is conveniently located in the exact middle between his house and his nail salon. Find the coordinates of his facial and label it on the graph point F .



4. Geometric Shape

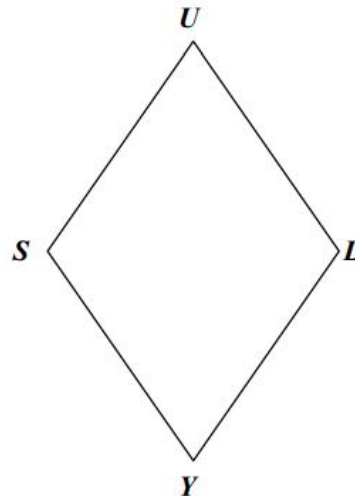
Mr. Sullivan is really into fancy bling. He picks up the diamond (rhombus) shown below and starts thinking.

Mark the following on the picture.

- $\overline{SU} \cong \overline{UL} \cong \overline{LY} \cong \overline{YS}$
- Draw \overline{UY} bisects \overline{SL} at C
- C is the midpoint of \overline{UY}

Find the following...

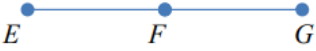
- $SU = 2x + 6$ and $UL = 9 - x$
Find x and SU



- What is the perimeter of rhombus $SULY$?

5. Proof

Label the picture and fill in the missing reasons in the two column proof.

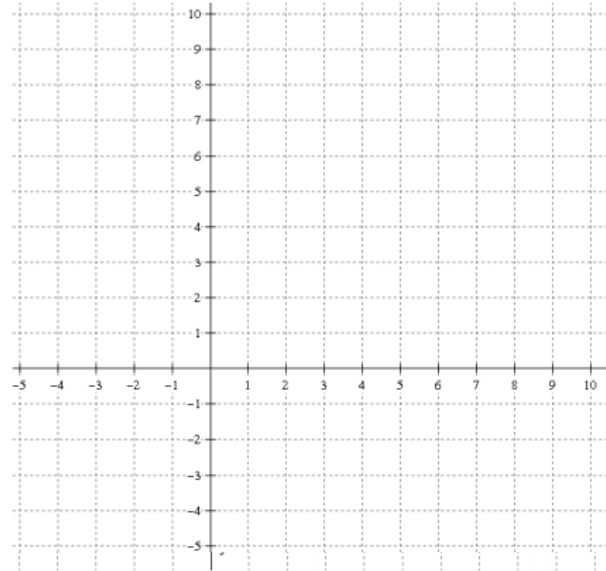
<p>Given: F is the midpoint of \overline{EG} $EF = 8x - 14$ $FG = 4x + 1$</p> <p>Prove: $x = \frac{15}{4}$</p>		
STATEMENT	REASON	
1. F is the midpoint of \overline{EG} $EF = 8x - 14$ $FG = 4x + 1$	1.	
2. $\overline{EF} \cong \overline{FG}$	2.	
3. $8x - 14 = 4x + 1$	3.	
4. $4x - 14 = 1$	4.	
5. $4x = 15$	5.	
6. $x = \frac{15}{4}$	6.	

Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of _____
- _____ Postulate
- _____ Theorem

6. Coordinate Geometry

- a. Graph the points
 $M(-2, 4)$
 $A(6, 4)$
 $T(6, -3)$
 $H(-2, -3)$
- b. Connect the points in order to make a rectangle.
- c. Draw in the diagonals \overline{MT} and \overline{AH} .
- d. Find the length of the diagonals \overline{MT} and \overline{AH} .



- e. Find the midpoints of both diagonals \overline{MT} and \overline{AH} .
- f. What appears to be true about the diagonals of the rectangle?

End of Course Test Questions

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

2017

Question 2

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

2017

Question 7

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.

people per square mile

2018

Question 11

Jeremy wants to know the density of a rock in grams per cubic centimeter. The rock has a mass of 1.08 kilograms and a volume of 400 cubic centimeters.

What is the density of the rock, in **grams** per cubic centimeter ($\frac{g}{cm^3}$)?

 $\frac{g}{cm^3}$

2019

Question 11

Point A is located at $(-1, -5)$. The midpoint of line segment AB is point C $(2, 3)$.

What are the coordinates of point B?

 ,

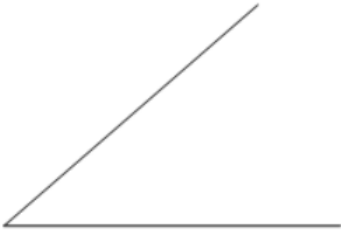
1	2	3		
4	5	6		
7	8	9		
	0			
.	-	$\frac{\square}{\square}$		

Angles Measures


Hw Section 1.3

Measure the following angles, then classify as acute, right, obtuse, or straight.

1.



2.



Draw a figure that fits each description.

3. an obtuse angle, $\angle RST$

4. a straight angle, $\angle RDM$

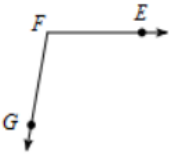
5. a right angle, $\angle RDM$ with an angle bisector of \overline{TD} .

Name the vertex and sides of the angle.

6.

Vertex =

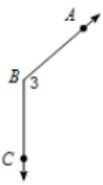
Sides =



7.

Vertex =

Sides =



Name the angle four different ways.

8.



9.



Name all the angles that have V as a vertex.

10.



11.



List all the information given by the diagram.

12.

13.

14.

Label the picture and use it to answer the following.

15.
Given
 \overline{EI} is the angle bisector of $\angle MEK$
 $m\angle MEI = 34^\circ$
 $m\angle IEK = 3x + 7$
Find x

16.
Given
 $\angle COR \cong \angle ROY$
 $m\angle COR = 62^\circ$
 $m\angle ROY = 82 - 4x$
Find x

17.
Given
 \overline{TM} is the angle bisector of $\angle ITY$
 $m\angle ITM = 3x + 15$
 $m\angle MTY = 7x - 13$
Find x

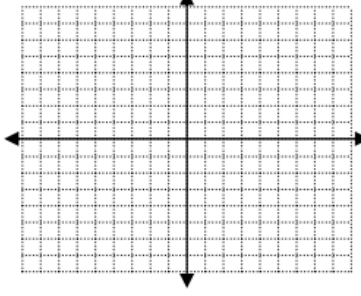
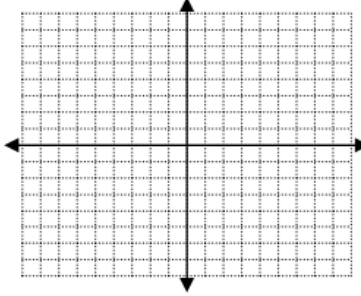
Find $m\angle MTY$

18.
Given
 $\angle RBO \cong \angle SBO$
 $m\angle SBO = 5x + 29$
 $m\angle RBO = 2x + 20$
Find x

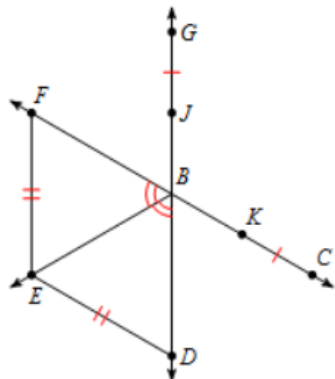
Find $m\angle RBO$

Angles Measures

Application Section 1.3

ALGEBRA REVIEW		
SOLVE $-12 = 10 - 4y$	$y = -x - 2$ GRAPH 	MULTIPLY (distribute) $5(4x - 3)$
SOLVE $13 - 2y = 5y - 8$	$y = -5$ GRAPH 	FACTOR Factor out the greatest common factor (undistribute) $10x^2 + 15x$

1. List all the information given by the diagram.



2. Draw the picture, label everything, find x , find $m\angle HAT$

Obtuse angle $\angle CAT$ with angle bisector of \overline{AH}

$$m\angle CAH = 3x + 56$$

$$m\angle HAT = 2x + 60$$

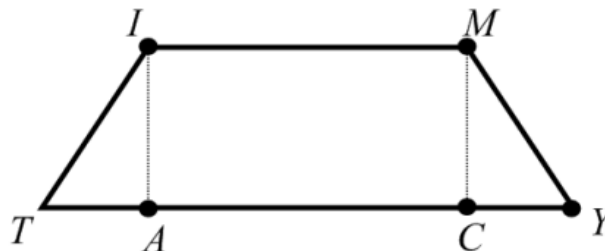
Watch the application walk through video if you need extra help getting started!

3. Geometric Shape

Mr. Kelly loves isosceles trapezoids (below). Help him mark his favorite shape with the following truths:

Isosceles Trapezoid $TIMY$

- $\angle ITA \cong \angle MYC$
- $\angle TIM \cong \angle IMY$
- $\angle IAC$ and $\angle MCY$ are right angles
- $\overline{TI} \cong \overline{MY}$
- $\overline{AT} \cong \overline{CY}$
- $\overline{MI} \cong \overline{CA}$



4. Coordinate Geometry

a. Graph the points

$T(-4,6)$

$R(2,-3)$

$I(10,-2)$

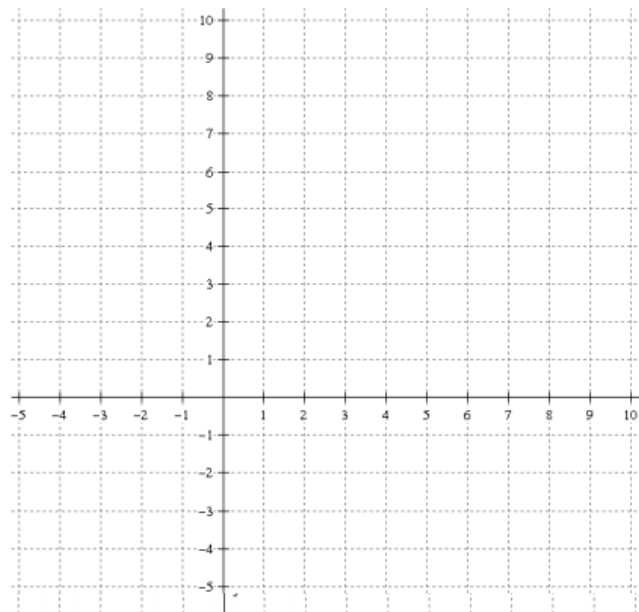
b. Connect the points in order to make a triangle, ΔTRI .

c. Name the obtuse angle.

d. Measure the obtuse angle.

e. Find the coordinates of the midpoint of \overline{TI} .

Plot on this point on the graph as point P



f. Draw \overline{RP} on the graph.

g. If \overline{RP} was the angle bisector of $\angle TRI$, what would have to be true?

5. Proof

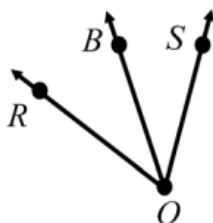
Label the picture and fill in the missing reasons in the two column proof.

Given: \overline{OB} is the angle bisector of $\angle ROS$

$m\angle ROB = 35$

$m\angle BOS = 4x + 3$

Prove: $x = 8$



Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of _____
- _____ Postulate
- _____ Theorem

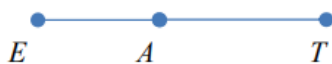
STATEMENT	REASON
1. \overline{OB} is the angle bisector of $\angle ROS$ $m\angle ROB = 35$ $m\angle BOS = 4x + 3$	1.
2. $\angle ROB \cong \angle BOS$	2.
3. $m\angle ROB = m\angle BOS$	3. Def'n of congruent
4. $35 = 4x + 3$	4.
5. $32 = 4x$	5.
6. $8 = x$	6.

Addition Postulates

Hw Section 1.4

Label the picture, then find the missing segment.

1.

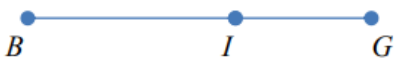


$$EA = 15$$

$$AT = 9$$

Find ET

2.

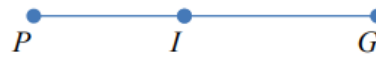


$$IG = 15$$

$$BG = 40$$

Find BI

3.



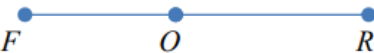
$$PI = 2x$$

$$IG = 18$$

$$PG = 34$$

Find PI

4.



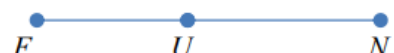
$$FO = 3y + 4$$

$$OR = 20$$

$$FR = 5y + 18$$

Find y Find FO

5.



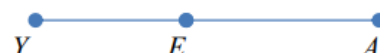
$$FU = 6x$$

$$UN = 5x + 18$$

$$FN = 15x - 2$$

Find x Find FN

6.



$$EA = 8y + 4$$

$$YE = 4y + 8$$

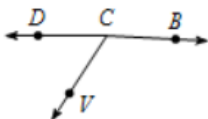
$$YA = 15y - 9$$

Find y Find EA **Use Angle Addition Postulate to answer the following.**

7.

$$m\angle BCV = 120^\circ \text{ and } m\angle BCD = 177^\circ.$$

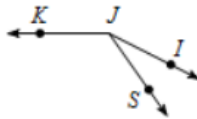
Find $m\angle VCD$.



8.

$$\text{Find } m\angle IJS \text{ if } m\angle IJK = 153^\circ$$

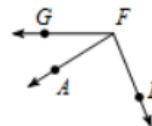
$$\text{and } m\angle SJK = 125^\circ.$$

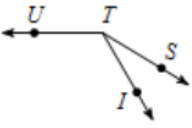
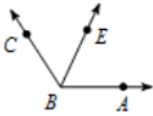
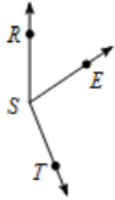
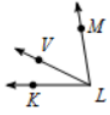
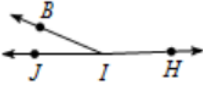
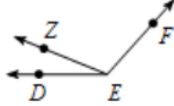


9.

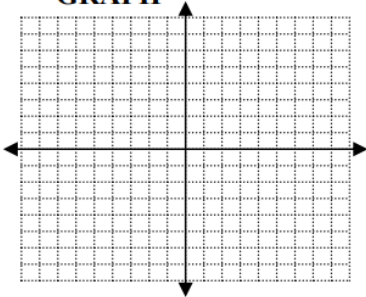
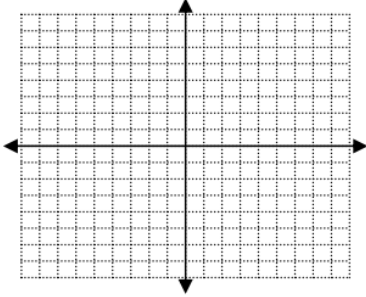
$$m\angle EFG = 112^\circ \text{ and } m\angle EFA = 80^\circ.$$

Find $m\angle AFG$.



<p>10. $m\angle ITU = 120^\circ$, $m\angle STI = 6x + 5$, and $m\angle STU = 36x + 5$. Find x.</p> 	<p>11. Find x if $m\angle CBE = 57x + 1$, $m\angle CBA = 124x - 1$, and $m\angle EBA = 65^\circ$.</p> 	<p>12. $m\angle RST = 158^\circ$, $m\angle RSE = 8x$, and $m\angle EST = 14x + 4$. Find x.</p> 
<p>13. Find $m\angle KLV$ if $m\angle VLM = 55^\circ$, $m\angle KLV = 4x + 2$, and $m\angle KLM = 12x + 9$.</p> 	<p>14. Find $m\angle JIB$ if $m\angle BIH = 37x + 7$, $m\angle JIH = 178^\circ$, and $m\angle JIB = 6x - 1$.</p> 	<p>15. $m\angle DEF = 66x$, $m\angle DEZ = 22^\circ$, and $m\angle ZEF = 55x$. Find $m\angle ZEF$.</p> 

ALGEBRA REVIEW

<p>SOLVE $6 = 2 + \frac{x}{3}$</p>	<p>GRAPH</p> <p>$y = \frac{1}{4}x - 2$</p> 	<p>MULTIPLY (distribute) $2x(-2x - 3)$</p>
<p>SOLVE $3 - 7y = 5y + 3$</p>	<p>GRAPH</p> <p>$x = -3$</p> 	<p>FACTOR Factor out the greatest common factor (undistribute) $16x + 40$</p>

Addition Postulates

Application Section 1.4

1. Label the picture and find the missing segment.

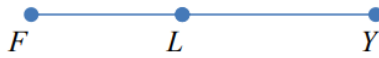
$$FY = 29$$

$$FL = 3x - 9$$

$$LY = 4x + 3$$

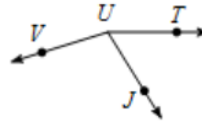
Find x

Find FL



- 2.

Find x if $m\angle TUV = 163^\circ$, $m\angle JUV = 35x$,
and $m\angle TUJ = 18x + 4$.



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

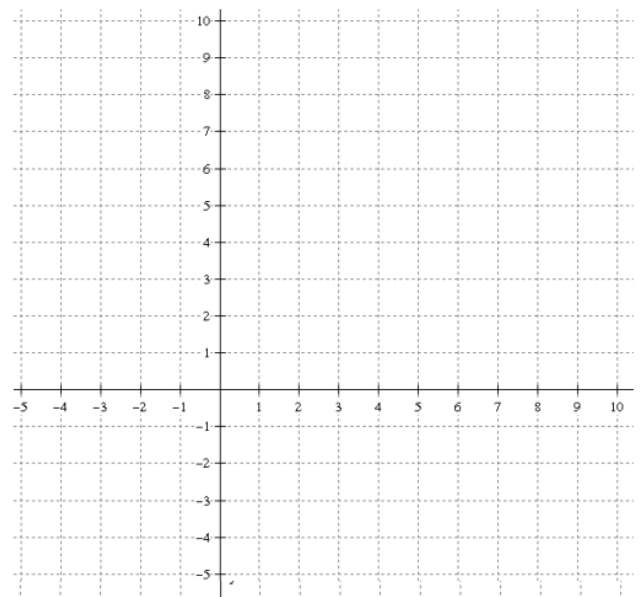
3. Cedar Point is an amusement park in **Sandusky**, OH. Mr. Kelly's mom decides that when Mr. Kelly turns 35 he can drive to Cedar Point all by himself. His mom is worried about Mr. Kelly's directional skills and makes the following map to help him find his way. MapQuest calculates the miles from Rochester (point A) to **Sandusky** (point B) as 314 miles. Let's estimate this trip and say that it is a perfectly straight line segment from A to B .

- a. 3 hours into his trip, Mr. Kelly stops for lunch in Erie (point E) after averaging 54 mph. Find AE .
- b. Mr. Kelly decides to live on the edge and average 56 mph the remainder of the drive. How much longer will he be travelling finish the trip EB ?



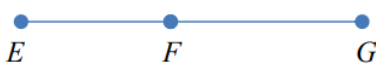
4. Coordinate Geometry

- a. Graph the points
 $M(2,1)$
 $A(6,-1)$
 $T(8,7)$
 $H(4,9)$
- b. Connect the points in order to make a parallelogram.
- c. Draw in the diagonals \overline{AH} and \overline{MT} and label their point of intersection point B .
- d. $m\angle TBH + m\angle HBM = m\angle$
- e. Find the distance of \overline{AH} .
- f. \overline{MT} bisects \overline{AH} at B . Find $AB =$ and $BH =$



5. Proof

Label the picture and fill in the missing reasons in the two column proof.

<p>Given: $EG = 59$ $EF = 8x - 14$ $FG = 4x + 1$</p> <p>Prove: $x = 6$</p>	
STATEMENT	REASON
1. $EG = 59$ $EF = 8x - 14$ $FG = 4x + 1$	1.
2. $EF + FG = EG$	2.
3. $8x - 14 + 4x + 1 = 59$	3.
4. $12x - 13 = 59$	4.
5. $12x = 72$	5.
6. $x = 6$	6.

Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of _____
- _____ Postulate
- _____ Theorem

6. Geometric Shape

Mr. Brust is flying a kite one day. He starts to day dream about segments.

Mark the following on the picture.

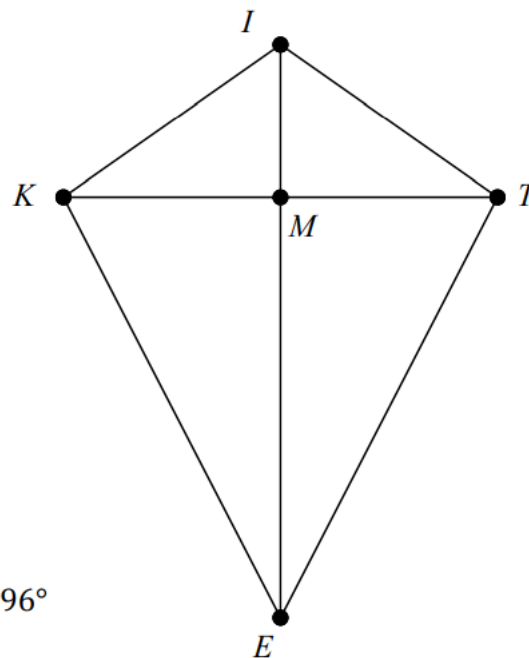
- a. $\overline{KI} \cong \overline{IT}$
- b. $\overline{KE} \cong \overline{ET}$
- c. M is the midpoint of \overline{KT}
- d. $\angle KIM \cong \angle TIM$
- e. $\angle KEM \cong \angle TEM$
- f. $\angle IKM \cong \angle ITM$

Find the following...

- g. If $KT = 64$ and $KM = 2x + 16$
Find MT

- h. If $\angle IKM = 5y - 18$ and $\angle MKE = 3y + 34$ and $\angle IKE = 96^\circ$
Find $\angle IKM$

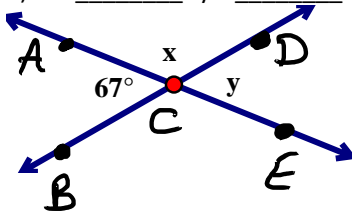
- i. The perimeter of quadrilateral $KITE$ is 220 cm. If $KI = 5y - 18$ and $KE = 4y + 16$
Find y



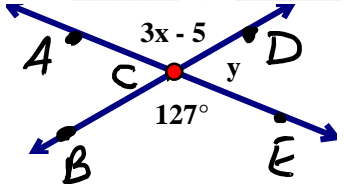
Angle Pairs

1. Solve the following.

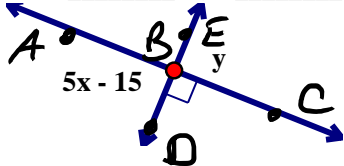
a) $x =$ _____ $y =$ _____



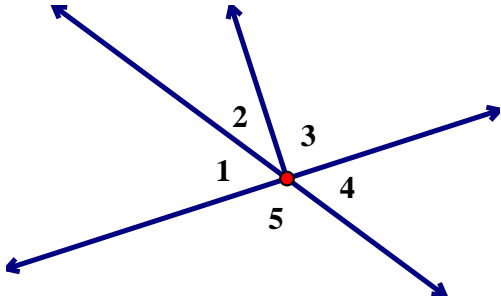
b) $x =$ _____ $y =$ _____



c) $x =$ _____ $y =$ _____



Use the figure below to determine if each statement is true or false.



- 2. $\angle 5$ and $\angle 3$ are vertical angles. T or F
- 3. $\angle 1$ and $\angle 5$ are a linear pair. T or F
- 4. $\angle 4$ and $\angle 3$ are adjacent angles. T or F
- 5. $\angle 4$ and $\angle 1$ are vertical angles. T or F
- 6. $\angle 3$ and $\angle 4$ are a linear pair. T or F

Hw Section 1.5

7. If $\angle 1$ and $\angle 2$ are supplements and $m\angle 1 = 150^\circ$, what is $m\angle 2$? _____

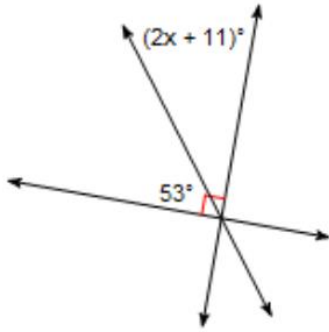
8. If $\angle 1$ and $\angle 2$ are complements and $m\angle 1 = 27^\circ$, what is $m\angle 2$? _____

9. If $\angle 1$ and $\angle 2$ are vertical angles and $m\angle 1 = 36^\circ$, what is $m\angle 2$? _____

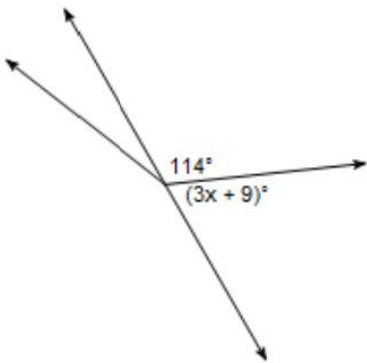
10. If $\angle 1$ and $\angle 2$ are a linear pair and $m\angle 1 = 2x + 8$ and $m\angle 2 = 3x + 2$, what is the value of x ? $x =$ _____

11. If $\angle 1$ and $\angle 2$ are vertical angles and $m\angle 1 = 7x - 5$ and $m\angle 2 = 4x + 10$, what is the value of x ? $x =$ _____

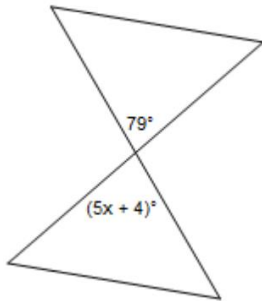
12. Find the value of x .



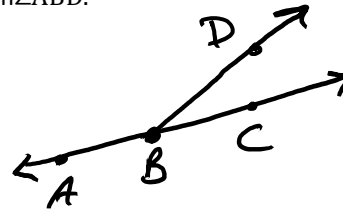
13. Find the value of x .



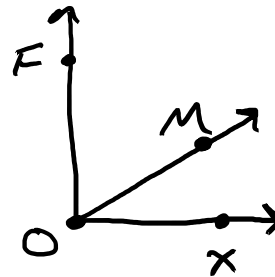
14. Find the value of x .



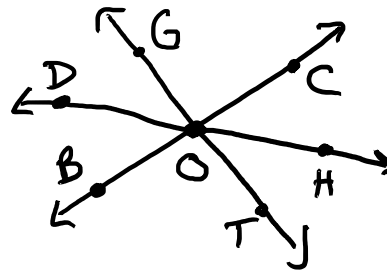
15. The $m\angle ABD = 5x - 11$, $m\angle CBD = 4x + 38$. Find $m\angle ABD$.



16. $m\angle FOM = 2x + 13$, $m\angle MOX = 3x - 3$ and $\angle FOX$ is a right angle. Find the value of x .



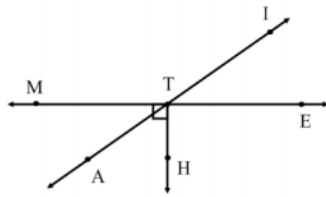
17. $\angle BOT$ is a right angle, $m\angle DOG = 2x - 4$, $m\angle HOT = x + 16$. Find $m\angle DOC$.



Angle Pairs

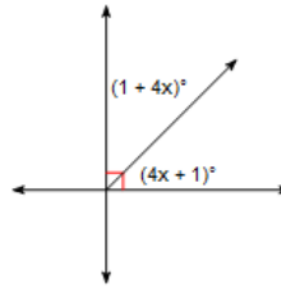
Application Section 1.5

1. Label the angle pairs as complementary, linear (supplementary), vertical, or adjacent.



Angle Pair	Name
$\angle MTI$ and $\angle ITE$	
$\angle MTA$ and $\angle ITE$	
$\angle MTA$ and $\angle ATH$	

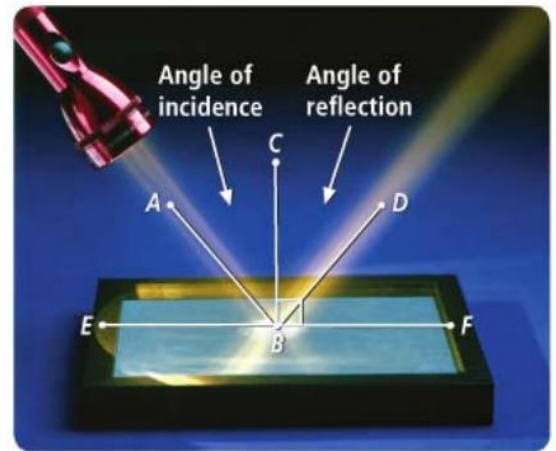
2. Find the value of x .



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

3. A beam of light and a mirror can be used to study the behavior of light. Light that strikes the mirror is reflected so that the angle of reflection and the angle of incidence are congruent. In the diagram, $\angle ABC$ has a measure of 41.

- Name the angle of reflection and find its measure.
- Find $m\angle ABD$
- Find $m\angle ABE$
- Find $m\angle DBF$
- What type of angles are $\angle CBD$ and $\angle DBF$?

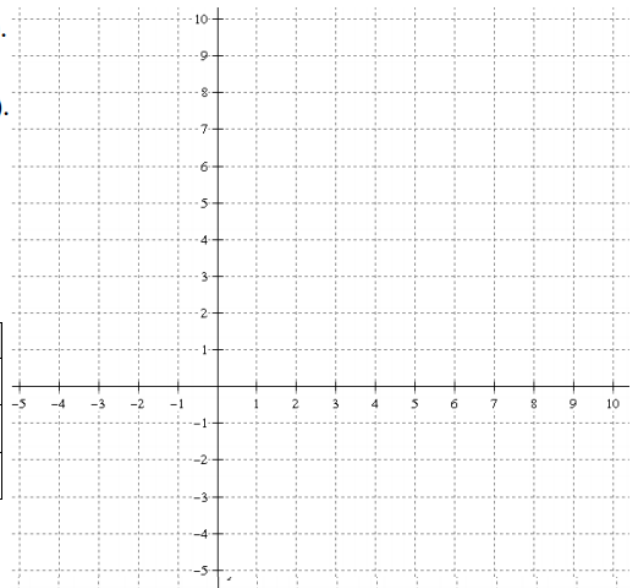


4. Coordinate Geometry

- Draw the line segment with endpoints A (-3, 2) and B (8, 6).
- Draw the line segment with endpoints C (-4, 7) and D (9,-4).
- Label the point of intersection of \overline{AB} and \overline{CD} as point E.
- Label each pair of angles as: Complementary, Linear (supplementary), Vertical, or Adjacent

Angle Pair	Name
$\angle AEC$ and $\angle CEB$	
$\angle AEC$ and $\angle BED$	
$\angle CEB$ and $\angle AED$	

- Is point E the midpoint of \overline{CD} ?

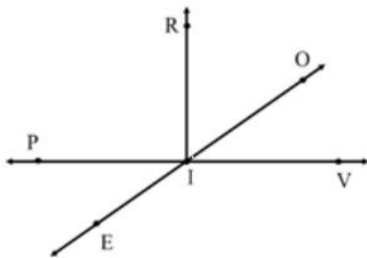


5. Proof

Label the picture and fill in the missing reasons in the two column proof.

Given: $\angle RIV$ is a right angle
 $m\angle PIE = 40$
 $\angle RIO = 3x + 14$

Prove: $x = 12$



Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of _____
- _____ Postulate
- _____ Theorem

STATEMENT	REASON
1. $\angle RIV$ is a right angle $m\angle PIE = 40$ $\angle RIO = 3x + 14$	1.
2. $m\angle PIE = m\angle OIV$	2.
3. $m\angle RIV = 90$	3.
4. $m\angle OIV + m\angle RIO = m\angle RIV$	4.
5. $40 + 3x + 14 = 90$	5.
6. $3x + 54 = 90$	6.
7. $3x = 36$	7.
8. $x = 12$	8.

6. Geometric Shape

As we all know Mr. Kelly loves Justin Bieber. His second favorite thing is Scholastic's *Math* magazine. Mr. Kelly's two favorite things came together in a special edition just for him. In this limited Bieber edition, Mr. Kelly found this puzzle. Help him solve the puzzle by filling in the measure of every angle on the picture!

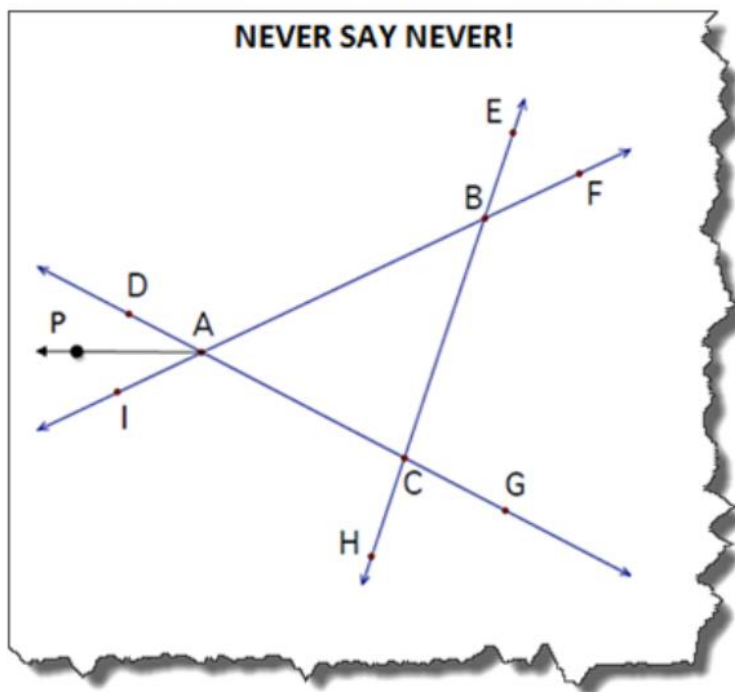
GIVEN:

$m\angle FBC = 140$

$m\angle DAI = 40$

$m\angle ABC + m\angle BCA + m\angle CAB = 180$

\overline{AP} is the angle bisector of $\angle DAI$



Tools for Geometry

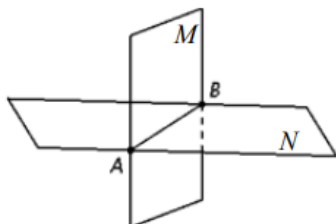
Review Chapter 1

<ul style="list-style-type: none"> • acute, right, obtuse straight angle • adjacent angles • angle bisector • collinear points • coplanar • complementary angles • congruent 	<ul style="list-style-type: none"> • distance • line • linear pair • measure of an angle • midpoint • plane • point • postulate 	<ul style="list-style-type: none"> • ray, opposite rays • segment • segment bisector • sides of an angle • space • supplementary angles • vertex of an angle • vertical angles
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$$M = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2} \right)$$

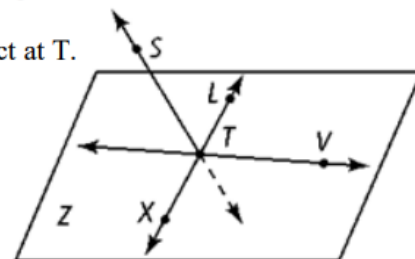
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

1. Add a point C to the picture so that it is collinear with A and B . Then add a point D so that it is coplanar with plane M .



2. Use picture to answer the following:

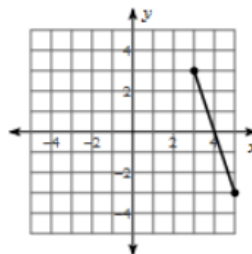
- Name the 3 lines that intersect at T .
- Name two opposite rays.
- Draw \overrightarrow{XV} .
- What is the intersection of plane Z and plane STL ?



Find the midpoint and distance between each pair of points.

3) $(-2, 2), (-2, 5)$

4)



Find the measure of each angle to the nearest degree. Classify the angle as obtuse, acute, straight, or right.

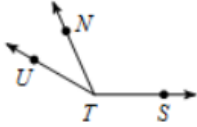
5)



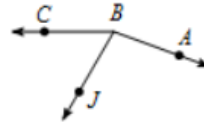
6)



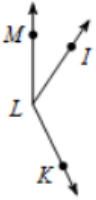
- 7) $m\angle UTS = 150^\circ$ and $m\angle UTN = 36^\circ$.
Find $m\angle NTS$.



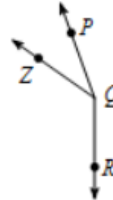
- 8) $m\angle ABJ = 11x + 1$, $m\angle ABC = 160^\circ$,
and $m\angle JBC = 6x + 6$. Find x .



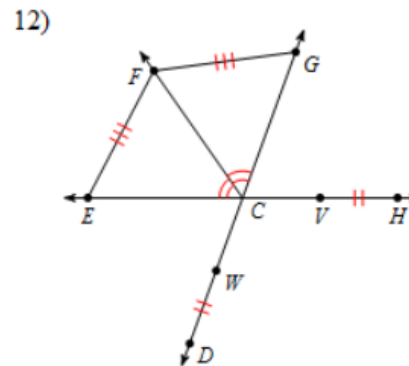
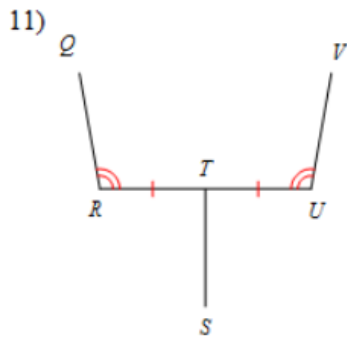
- 9) Find $m\angle MLI$ if $m\angle MLK = 154^\circ$,
 $m\angle MLI = 3x + 13$, and $m\angle ILK = 8 + 16x$.



- 10) $m\angle ZQP = 5x - 5$, $m\angle RQP = 20x$,
and $m\angle RQZ = 125^\circ$. Find $m\angle RQP$.



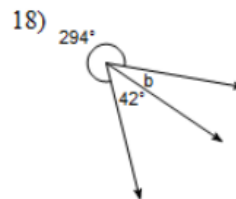
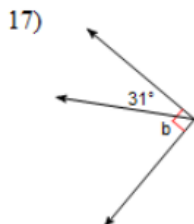
List all information given by the marks on the diagram.



Name the relationship: adjacent, complementary, linear pair (supplementary), or vertical angles

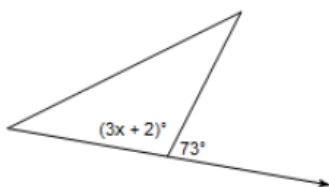
<p>13.</p>	<p>14.</p>	<p>15.</p>	<p>16.</p>
------------	------------	------------	------------

Find the measure of angle b.

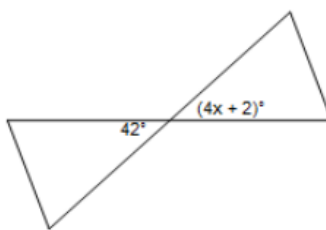


Find the value of x .

19)



20)



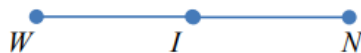
21.

Given

I is the midpoint of \overline{WN}

$WI = 5x - 12$

$IN = 2x + 6$



Find x

Find WI

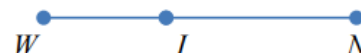
22.

Given

$WN = 6x + 3$

$WI = 12$

$IN = 5x - 4$



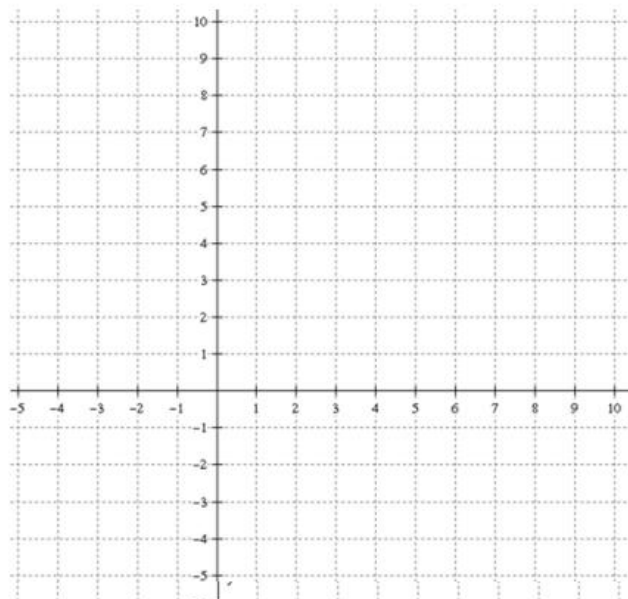
Find x

Find IN

APPLICATIONS

1. Coordinate Geometry

- a. Graph the points $A(4, 7)$ and $B(0, 0)$ and $C(8, 1)$
- b. Connect the points in order to make a triangle, ΔABC
- c. Find BA .
- d. Given $BC = \sqrt{65}$, what is true about BA and BC ?
- e. Find the midpoint of \overline{AC} . Plot on graph as point D .
- f. Draw \overrightarrow{BD} on the graph. \overrightarrow{BD} is the angle bisector of $\angle ABC$. Mark the picture to show this.

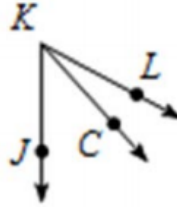


2. Proof

Label the picture and fill in the missing reasons in the two column proof.

Given: $m\angle CKJ = 6x$
 $m\angle LKJ = 9x - 1$
 $m\angle LKC = 20$

Prove: $x = 7$



Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of _____
- _____ Postulate
- _____ Theorem

STATEMENT	REASON
1. $m\angle CKJ = 6x$ $m\angle LKJ = 9x - 1$ $m\angle LKC = 20$	1.
2. $m\angle CKJ + m\angle LKC = m\angle LKJ$	2.
3. $6x + 20 = 9x - 1$	3.
4. $6x = 9x - 21$	4.
5. $-3x = -21$	5.
6. $x = 7$	6.

3. Geometric Shape

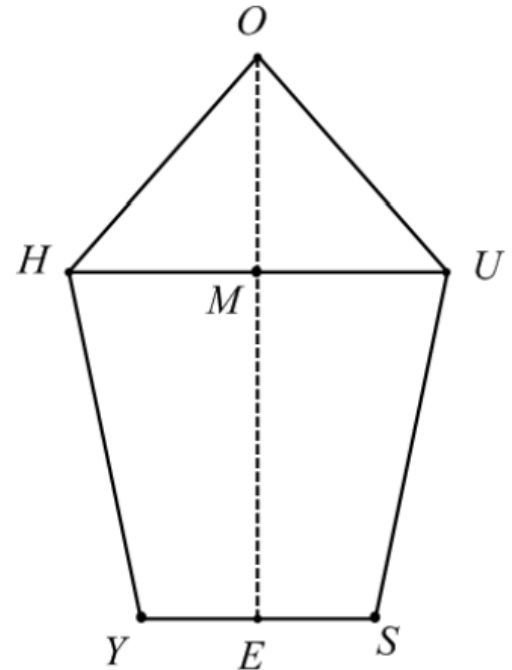
Mr.Sullivan’s dream home is in the shape of a pentagon. Help him answer the questions below.

Mark the picture with the following.

- a. $\overline{HY} \cong \overline{US}$
- b. \overline{OE} is the bisector of \overline{HU}
- c. $\angle HMO$ is a right angle
- d. E is the midpoint of \overline{YS}
- e. $\overline{OH} \cong \overline{OU}$
- f. $\angle OHU \cong \angle MUO$

Use the info to find the following.

- g. Given $YE = 4x + 3$ and $YS = 39$, find x .



- h. Given $m\angle OHU = 4x + 3$ and $m\angle MUO = 5x - 9$, find x and $m\angle MUO$

Inductive Reasoning

Hw Section 2.1

If the given statement is not in if-then form, rewrite it. Identify the hypothesis and the conclusion. Then write the converse, inverse, and contrapositive.

1. *If a figure is a rectangle, then it has four sides.*

- If-Then Conditional statement: _____
- Hypothesis: _____
- Conclusion: _____
- Converse: _____
- Inverse: _____
- Contrapositive: _____

2. *All Europeans live in Germany.*

- If-Then Conditional statement: _____
- Hypothesis: _____
- Conclusion: _____
- Converse: _____
- Inverse: _____
- Contrapositive: _____

3. *If $x = -6$, then $|x| = 6$.*

- If-Then Conditional statement: _____
- Hypothesis: _____
- Conclusion: _____
- Converse: _____
- Inverse: _____
- Contrapositive: _____

Determine the truth-value for the following statements. If a statement is false, give a counter example.

4. If an animal is a mammal, it lives on land.
5. If a number is prime, then it is odd.
6. If your first name is Joe, then your last name is Mammah.
7. If the figure is a triangle, then the sum of the interior angles is 180° .
8. If a figure has 4 congruent sides, then that figure is a square.

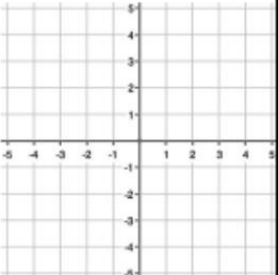
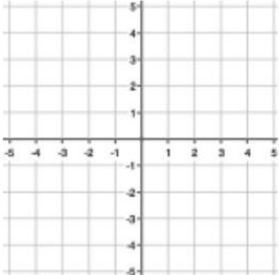
Find a pattern for each sequence. Use the pattern to find the next two terms.

9. 4, 4.5, 4.56, 4.567... 10. 1, -1, 2, -2, 3... 11. J, F, M, A, M, ...

Use the sequence and inductive reasoning to make a conjecture:



12. What pattern is in the 15th figure? 13. What is the shape of the 12th figure?

Solve each equation for x!		Multiply!	Factor!
1. $3x - 3 = -6$	2. $4x + 1 = 13x - 13$	3. $x(x - 2)$	4. $4x^3 - 8x^2$
5. Graph the equation: $y = -x + 3$		6. Graph the equation: $y = 1$	

Inductive Reasoning

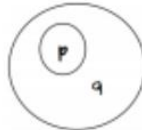
Application Section 2.1

If the given statement is not in if-then form, write it in if-then form. Identify the hypothesis and the conclusion. Then write the contrapositive. Determine the true-value of both statements.

1. *All woodchucks chuck wood.*

- a. If-Then Conditional statement: _____
- b. Hypothesis: _____
- c. Contrapositive: _____

Sometimes Venn Diagrams can be used to represent conditional statements. $p \rightarrow q$ can be represented by the Venn Diagram:

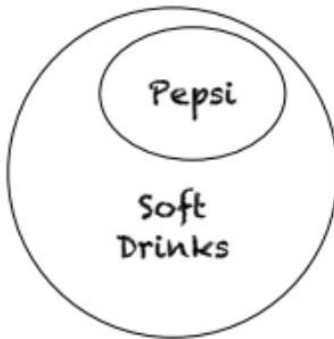


Think of this as: "If p happens, then q definitely happens."

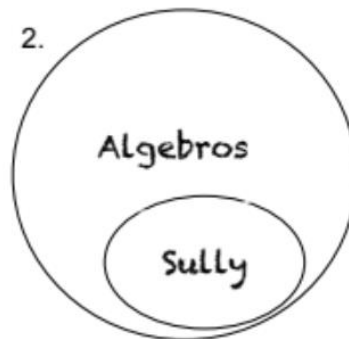
For example,  would represent: *"If a team is the AFC East, then it is an NFL team."*

Write a conditional statement that each Venn Diagram illustrates:

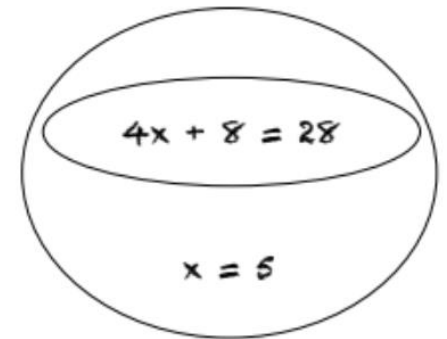
1.



2.



3.



Draw a Venn diagram to represent the following conditional statements. (Rewrite in if-then form if necessary.)

4. *If two figures are congruent, then they have equal areas:*

5. *The Geometry packets Mr. Kelly makes are super long:*

End of Course Test Questions 2018

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

Question 11

Jeremy wants to know the density of a rock in grams per cubic centimeter. The rock has a mass of 1.08 kilograms and a volume of 400 cubic centimeters.

What is the density of the rock, in **grams** per cubic centimeter ($\frac{g}{cm^3}$)?

$\frac{g}{cm^3}$

Algebraic Proofs

Hw Section 2.2

Support each conclusion with a valid reason.

1. Given: $x - 42 = 12$

Conclusion: $x = 54$

2. Given: $23(2 + x) = 230$

Conclusion: $2 + x = 10$

3. Given: $3x - 7x = 20$

Conclusion: $-4x = 20^\circ$

4. Given: $-x = 34$

Conclusion: $x = -34$

5. If $12 = d$ and $d = x$,
then $12 = x$.

6. $GH = GH$

Fill in the missing statements or reasons for the following two-column proof.

Given: $4x - 20 = 100$ Prove: $x = 30$

	Statement	Reason
Proof #1	1. $4x - 20 = 100$	1.
	2. $4x = 120$	2.
	3. $x = 30$	3.

Given: $12 - x = 10$ Prove: $x = 2$

	Statement	Reason
Proof #2	1.	1.
	2. $-x = -2$	2.
	3. $x = 2$	3.

Given: $5x + 20 = 20 + -2x$ Prove: $x = 0$

	Statement	Reason
Proof #3	1.	1.
	2. $3x = -2x$	2.
	3. $5x = 0$	3.
	4.	4.

Given: $12 - x = 10$ Prove: $x = 2$

	Statement	Reason
Proof #4	1.	1.
	2. $12 = 10 + x$	2.
	3. $2 = x$	3.
	4.	4.

Proof #5.

Given: $10 - 3(4x - 2) + 1 = 77$

Prove: $x = -5$

Statement	Reason
1.	1.
2. $-3(4x - 2) + 1 = 67$	2.
3. $-3(4x - 2) = 66$	3.
4. $-12x + 6 = 66$	4.
5. $-12x = 60$	5.
6.	6.

Proof #6. Prove that if $\frac{8}{3}x + \frac{1}{3} = \frac{11}{3}x - \frac{2}{3}$, then $x = 1$.

Given: _____

Prove: _____

Statement _____ Reason _____

a. a.

b. b.

c. c.

d. d.

e. e.

f. f.

Proving Segments

Hw Section 2.3

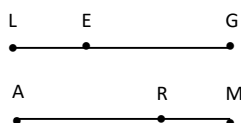
1. Prove the Midpoint Theorem using a two-column proof.

Given

Prove

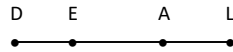
Statement	Reason
a.	a.
b.	b.
c.	c.
d.	d.
e.	e.
f.	f.

2. Given $\overline{LE} \cong \overline{MR}$, $\overline{EG} \cong \overline{RA}$
 Prove $\overline{LG} \cong \overline{MA}$



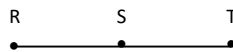
Statement	Reason
a.	a. Given
b. $LE = MR$ $EG = RA$	b.
c. $LG = LE + EG$ $MA = MR + RA$	c.
d. $LG = MR + RA$	d. Substitution Property of Equality (double)
e.	e. Substitution Property of Equality
f. $\overline{LG} \cong \overline{MA}$	f.

3. Given $DA = EL$
 Prove $DE = AL$



Statement	Reason
a.	a. Given
b. $DA = DE + EA$ $EL = EA + AL$	b.
c.	c. Substitution Property of Equality
d. $DE = AL$	d.

4. Given $RS = ST$
 Prove $RT = 2ST$



Statement	Reason
a.	a.
b.	b.
c.	c.
d.	d.
e.	e.
f.	f.

Proving Segments

Application Section 2.3

1. Given $\overline{SA} \cong \overline{ND}$
 Prove $\overline{SN} \cong \overline{AD}$

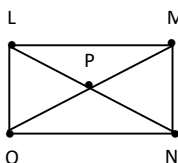


Statement

Reason

- | | |
|----|----|
| a. | a. |
| b. | b. |
| c. | c. |
| d. | d. |
| e. | e. |
| f. | f. |

2. Given $MP = NP$
 $PO = PL$
 Prove $MO = NL$

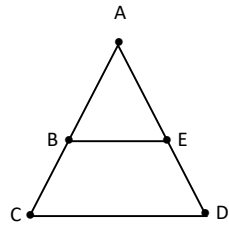


Statement

Reason

- | | |
|----|----|
| a. | a. |
| b. | b. |
| c. | c. |
| d. | d. |
| e. | e. |
| f. | f. |

3. Given $AC = AD$
 $AB = AE$
- Prove $BC = ED$



Statement

Reason

a.

a.

b.

b.

c.

c.

d.

d.

e.

e.

f.

f.

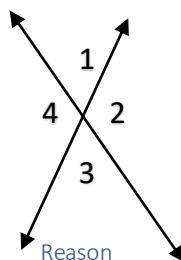
Proving Angles

1.

Given $\angle 1$ and $\angle 2$ form a linear pair
 $\angle 2$ and $\angle 3$ form a linear pair

Prove $\angle 1 \cong \angle 3$

Hw Section 2.4

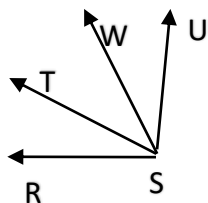


Statement	Reason
a.	a.
b.	b.
c.	c.
d.	d.
e.	e.
f.	f.

2.

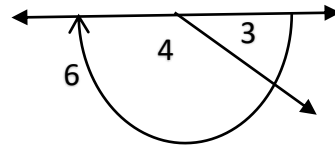
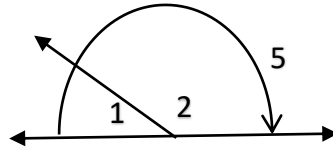
Given $m\angle RSW = m\angle TSU$

Prove $m\angle RST = m\angle WSU$



Statement	Reason
a.	a.
b.	b.
c.	c.
d.	d.
e.	e.
f.	f.

3.
 Given $\angle 1 \cong \angle 3$
 Prove $\angle 2 \cong \angle 4$



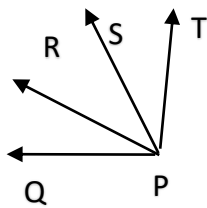
Statement	Reason
a. $\angle 1 \cong \angle 3$	a.
b. $m\angle 1 = m\angle 3$	b.
c. $\angle 1$ and $\angle 2$ are linear pair $\angle 3$ and $\angle 4$ are linear pair	c.
d. $\angle 1$ and $\angle 2$ are Supplementary $\angle 3$ and $\angle 4$ are Supplementary	d.
e. $m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 3 + m\angle 4 = 180^\circ$	e.
f. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	f.
g. $m\angle 3 + m\angle 2 = m\angle 3 + m\angle 4$	g.
h. $m\angle 2 = m\angle 4$	h.
i. $\angle 2 \cong \angle 4$	i.

Proving Angles

Application Section 2.4

1. Given $\angle QPS \cong \angle TPR$

Prove $\angle QPR \cong \angle TPS$



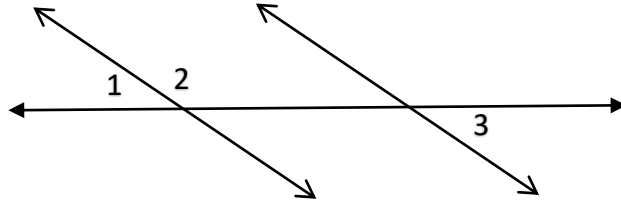
Statement	Reason
a.	a.
b. $m\angle QPS = m\angle TPR$	b.
c. $m\angle QPS = m\angle QPR + m\angle RPS$ $m\angle TPR = m\angle TPS + m\angle RPS$	c.
d.	d. Substitution Property of Equality
e.	e.
f.	f.

Geometry 40

2.

Given $\angle 1$ and $\angle 2$ form a linear pair
 $\angle 2$ and $\angle 3$ are supplementary

Prove $\angle 1 \cong \angle 3$



Statement	Reason
a.	a.
b.	b.
c.	c.
d.	d.
e.	e.
f.	f.
g.	g.
h.	h.

Reasoning & Proof

Review Chapter 2

Rewrite the given statement into if-then form. Then tell what the converse, inverse, contrapositive is.

1. *All octagons have 8 sides.*

- a. If-Then Conditional statement: _____
- b. Hypothesis: _____
- c. Conclusion: _____
- d. Converse: _____
- e. Inverse: _____
- f. Contrapositive: _____

Determine the truth-value for the following statements. If a statement is false, give a counter example.

2. If you are a freshman, then you have Mr. Sullivan for math.
3. If a number is divisible by 10, then it ends with a "0".
4. If your first name is Barb, then your last name is Dwyer.
5. If the figure is a triangle, then its angles are all acute.

Find a pattern for each sequence. Use the pattern to find the next two terms.

6. 30, 23, 16, 9...

7. 1, 0, 10, 0, 100, ...

8. 64, 32, 16...

Use the sequence and inductive reasoning to make a conjecture:



9. What pattern is in the 18th figure?

10. What is the shape of the 27th figure?

Support each conclusion with a valid reason.

11. Given: $5x = 25$

12. Given: $3(2y + x) = -12$

13. Given: $-x = 21$

Conclusion: _____

Conclusion: _____

Conclusion: _____

Reason: _____

Reason: _____

Reason: _____

14.

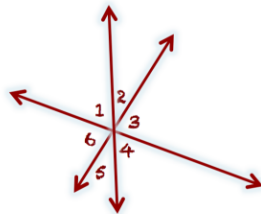
Given: $24 - 2(x - 2) - 30 = 0$

Prove: $x = -1$

#14 (Proof)

Statement	Reason
1. $24 - 2(x - 2) - 30 = 0$	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

15.



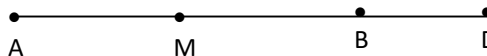
Unit 2 Application

Given: $\angle 2 \cong \angle 6$
 Prove: $\angle 3 \cong \angle 5$

#15 (Proof)

Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

16. Given M is the midpoint of \overline{AB}
 B is the midpoint of \overline{MD}
 Prove $MD = 2MB$

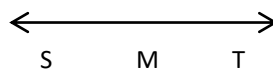


Statements

Reasons

- | | | |
|----|--|----------|
| a. | M is the midpoint of \overline{AB}
B is the midpoint of \overline{MD} | a. _____ |
| b. | AM = MB
MB = BD | b. _____ |
| c. | MD = MB + BD | c. _____ |
| d. | MD = MB + MB | d. _____ |
| e. | MD = 2MB | e. _____ |

17. Given M is the midpoint of \overline{ST}
 Prove $ST = 2MT$



Statements

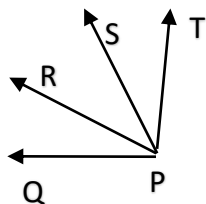
Reasons

- | | |
|----|----|
| a. | a. |
| b. | b. |
| c. | c. |
| d. | d. |
| e. | e. |
| f. | f. |
| g. | g. |

18.

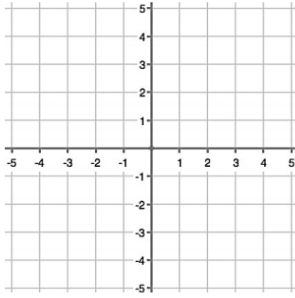
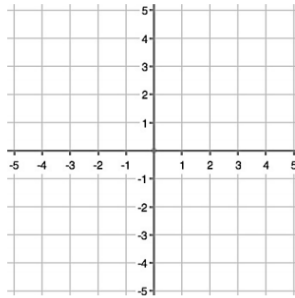
Given $\angle QPS \cong \angle TPR$

Prove $\angle QPR \cong \angle TPS$



Statement	Reason
a.	a.
b. $m\angle QPS = m\angle TPR$	b.
c. $m\angle QPS = m\angle QPR + m\angle RPS$ $m\angle TPR = m\angle TPS + m\angle RPS$	c.
d.	d. Substitution Property of Equality
e.	e.
f.	f.

Algebra Review

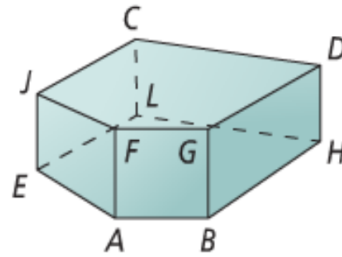
Solve each equation for x!		Multiply!	Factor!
1. $12x - 6 = -3$	2. $5x - 4 = 3x - 4$	3. $5x(3x - 2)$	4. $10x^2 - 20x$
5. Graph the equation: $y = 5 - 2x$		6. Graph the equation: $y = 5$	

Lines & Angles

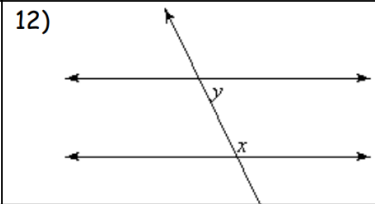
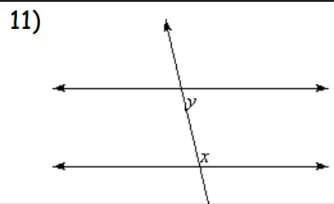
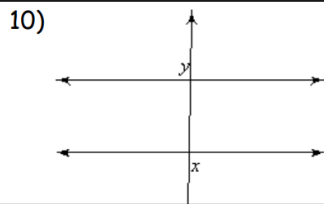
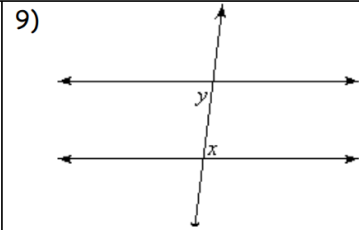
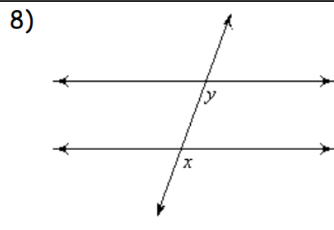
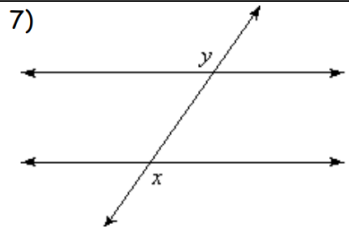
Hw Section 3.1

Directions: Use the diagram to name each of the following. Assume that lines and planes that appear to be parallel are parallel.

- 1) a pair of parallel planes
- 2) all lines that are parallel to \overline{AB}
- 3) all lines that are parallel to \overline{DH}
- 4) two lines that are skew to \overline{EJ}
- 5) all lines that are parallel to plane JFAE
- 6) a plane parallel to \overline{LH}

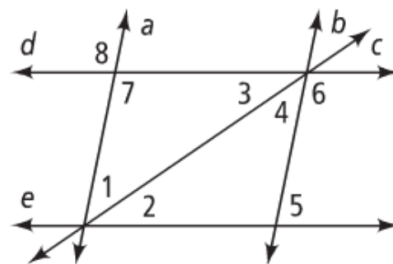


Directions: Identify each pair of angles as corresponding, alternate interior, alternate exterior, or same-side interior.



Directions: Identify all pairs of each type of angles in the diagram. Name the two lines and the transversal that form each pair.

- 13) corresponding angles
- 14) alternate interior angles
- 15) alternate exterior angles
- 16) same-side interior angles

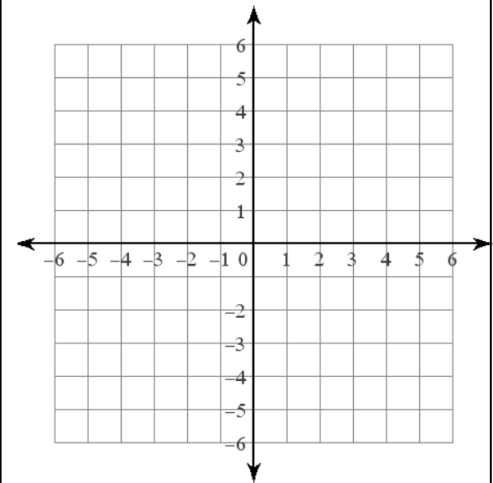
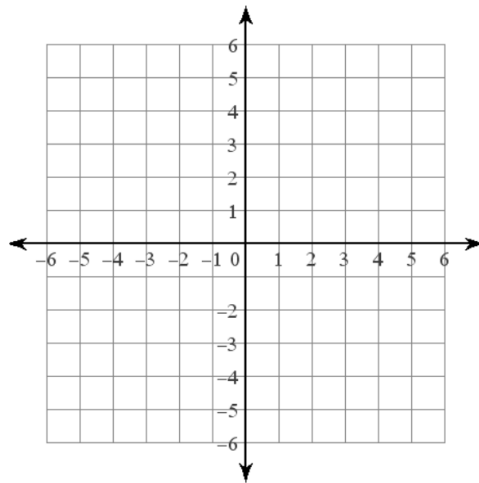


Directions: Determine whether each statement is always, sometimes or never true.	
17) Two parallel lines are coplanar	18) Two skew lines are coplanar
19) Two planes that do not intersect are parallel	20) Two lines in intersecting planes are skew
21) A line and a plane that do not intersect are skew	22) Alternate interior angles are on the same side of a transversal

Algebra Review

Solve: $-4 = \frac{x}{5} - 8$	Solve: $4x + 3 = 17$	Factor: $k^2 + 7k - 30$
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Factor: $-7x^7 - 28x^2 + 42x$	Graph: $y = -\frac{5}{2}x - 2$	Graph: $y = \frac{5}{2}x - 4$
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End of Course Test Questions 2017

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

Question 16

Kevin asked Olivia what parallel lines are. Olivia responded, "They are lines that never intersect."

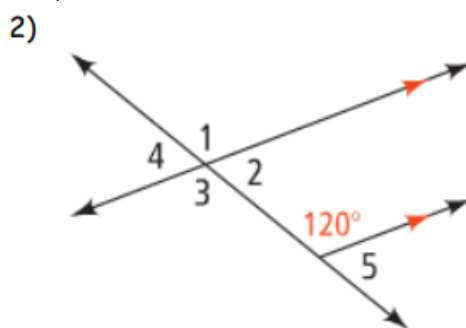
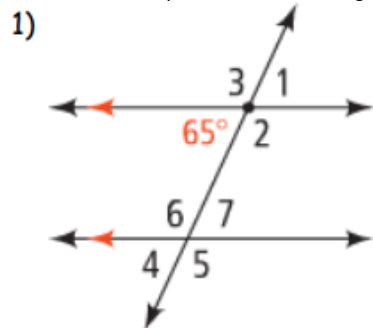
What important piece of information is missing from Olivia's response?

- (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.

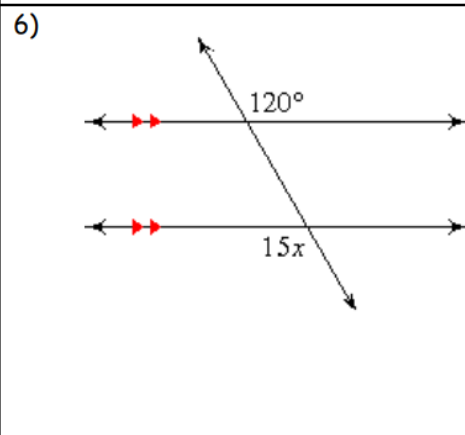
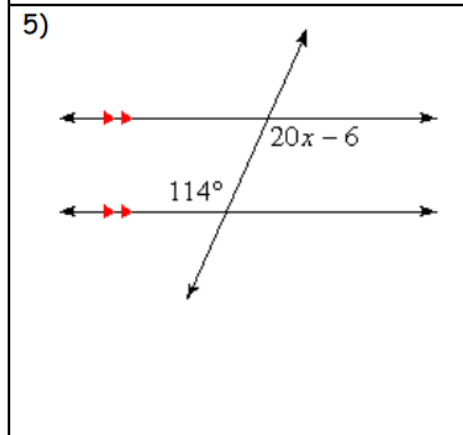
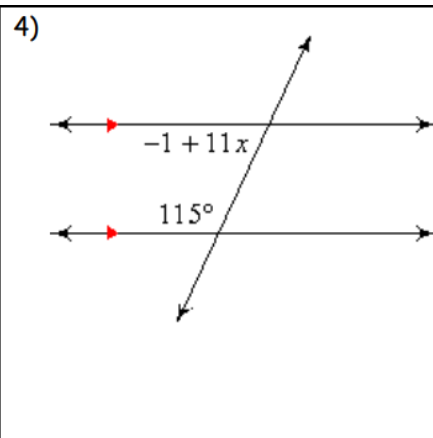
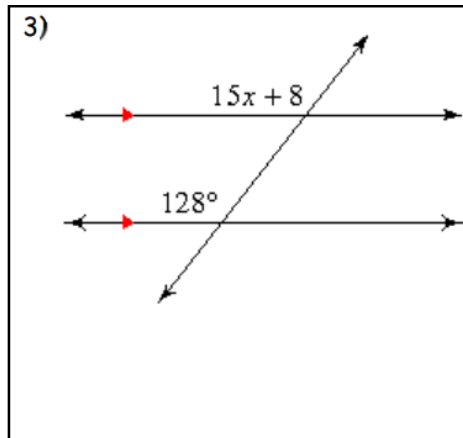
Properties of Parallel Lines

Hw Section 3.2

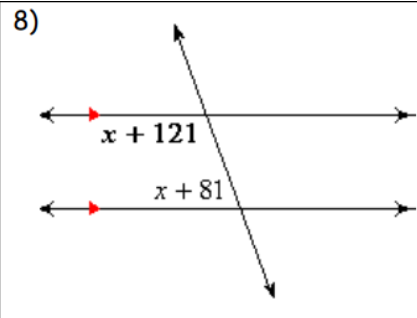
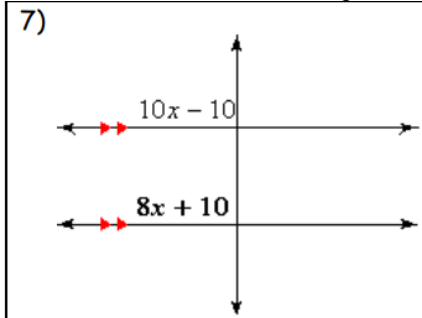
Directions: Identify all the numbered angles that are congruent to the given angle. JUSTIFY your answer.



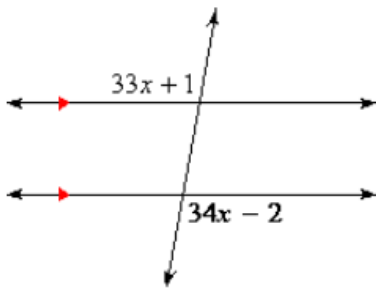
Directions: Solve for x.



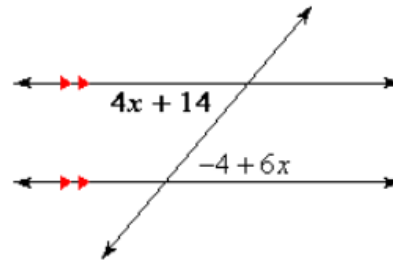
Directions: Find the measure of the angle indicated in bold.



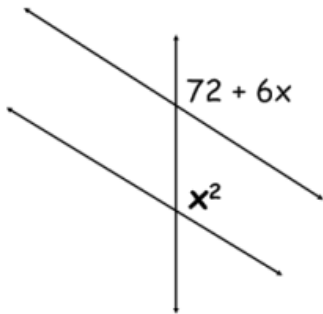
9)



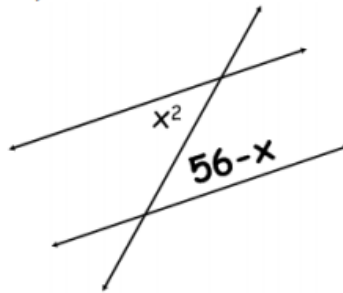
10)



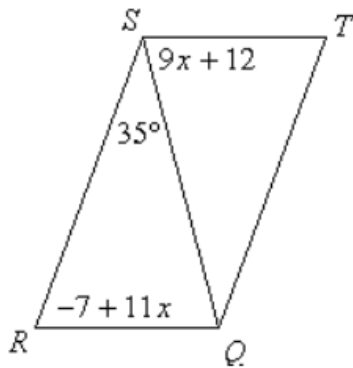
11)



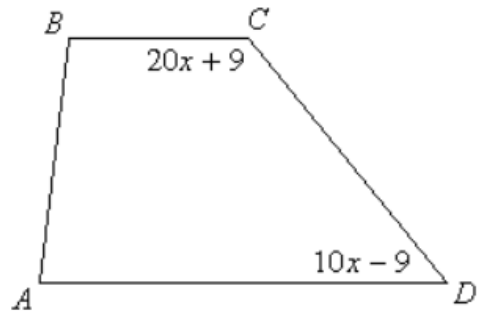
12)



13) Solve for x . Opposite sides of the figure are parallel.



14) Solve for x . The top and bottom sides are parallel.



Algebra Review

Solve: $2 = \frac{x}{3} - 4$

Solve: $15 = 2x - 13$

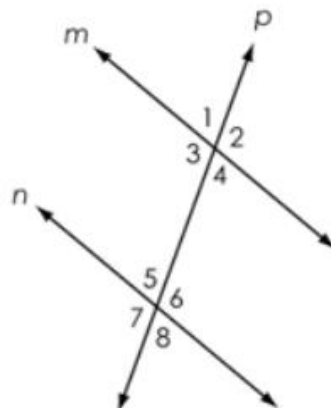
Factor: $k^2 + 14k + 45$

End of Course Test Questions 2018

Question 39

Given: $m \parallel n$ and transversal p

Prove: $\angle 5 \cong \angle 4$



Part of a proof is shown. Place statements and reasons in the table to complete the proof.

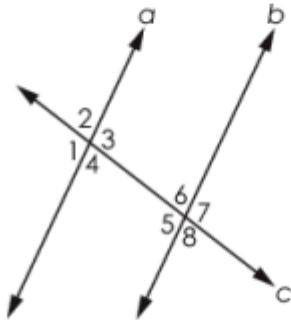
Statements	Reasons
1. $m \parallel n$ and transversal p	1. Given
2.	2.
3.	3.
4. $\angle 5 \cong \angle 4$	4.

$\angle 8 \cong \angle 1$	Vertical angles theorem
$\angle 1 \cong \angle 4$	Corresponding angles postulate
$\angle 8 \cong \angle 4$	Transitive property
$\angle 5 \cong \angle 8$	Alternate exterior angles theorem
$\angle 5 \cong \angle 7$	Reflexive property
$\angle 4 \cong \angle 7$	Angle addition postulate

End of Course Test Questions 2019

Question 40

Two parallel lines, a and b , are cut by a transversal c as shown.



Drag a statement or reason to each blank in the table to complete the proof that $\angle 1 \cong \angle 7$.

Statements	Reasons
1. $a \parallel b$	1. Given
2. <input type="text"/>	2. <input type="text"/>
3. <input type="text"/>	3. <input type="text"/>
4. $\angle 1 \cong \angle 7$	4. <input type="text"/>

$\angle 1 \cong \angle 3$

$\angle 1 \cong \angle 4$

$\angle 1 \cong \angle 5$

$\angle 3 \cong \angle 5$

$\angle 3 \cong \angle 7$

$\angle 4 \cong \angle 6$

$\angle 5 \cong \angle 7$

$\angle 6 \cong \angle 7$

Transitive property

Vertical angles are congruent.

Definition of supplementary angles.

Corresponding angles formed by parallel lines are congruent.

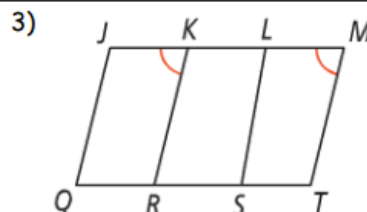
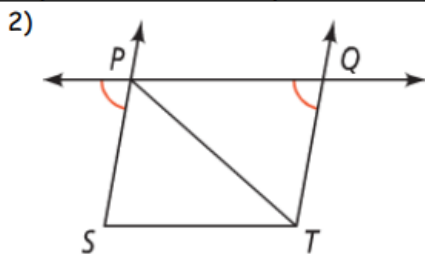
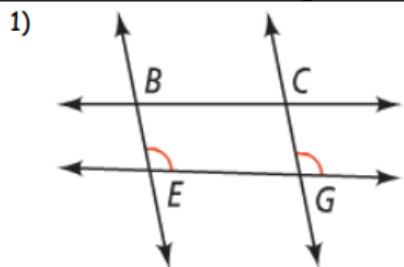
Alternate interior angles formed by parallel lines are congruent.

Alternate exterior angles formed by parallel lines are congruent.

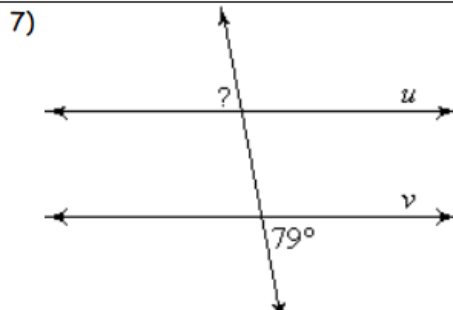
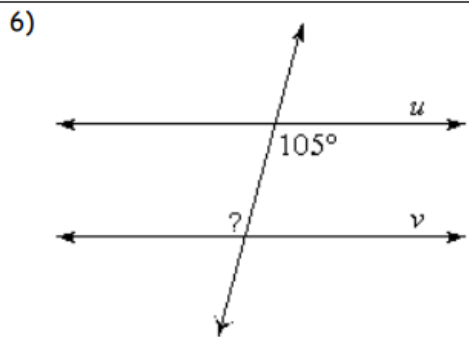
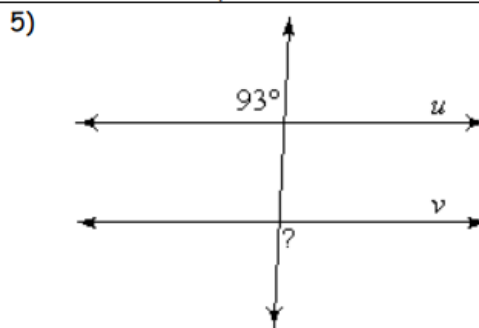
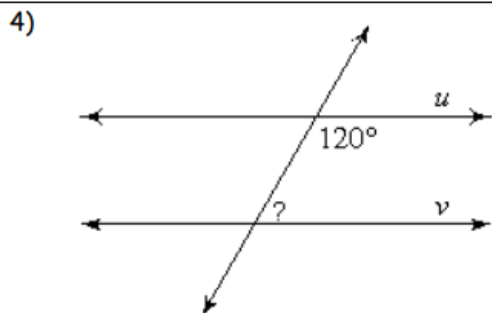
Proving Lines Parallel

Hw Section 3.3

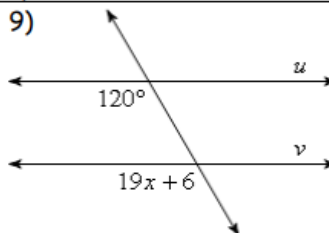
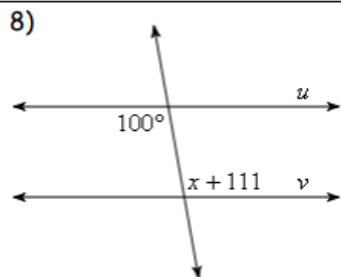
Directions 1-3: Which segments/lines are parallel. JUSTIFY your answer.

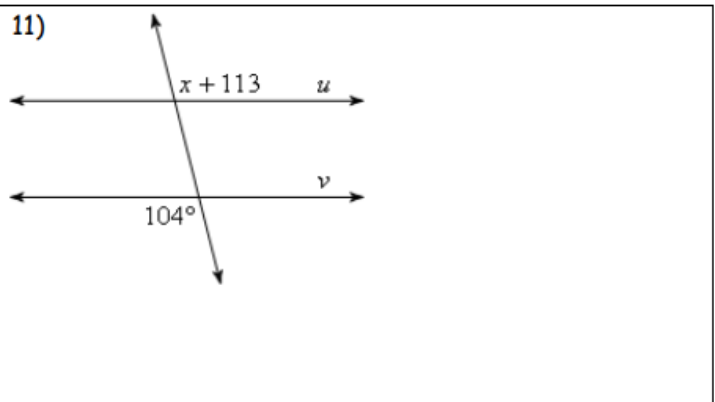
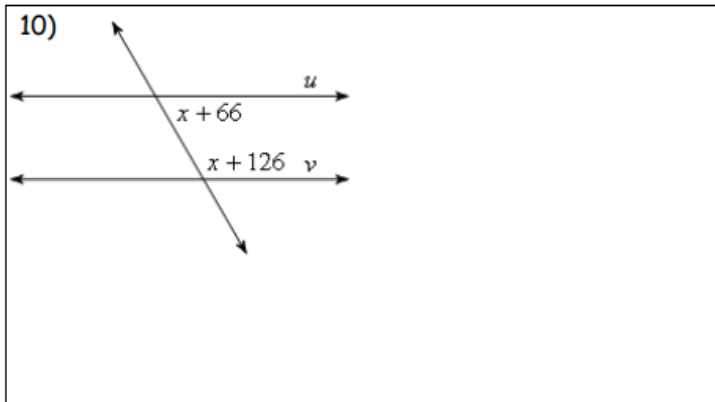


Directions: Find the measure of the indicated angle that makes lines u and v parallel.



Directions: Find the values of x that will make lines u and v parallel.





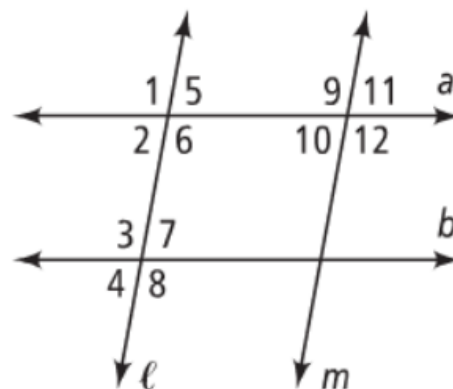
Directions: Use the following diagram to determine which lines (if any are parallel). State the postulate or theorem that justifies your answer.

12) $\angle 2$ is supplementary to $\angle 3$

13) $\angle 9 \cong \angle 12$

14) $\angle 5 \cong \angle 10$

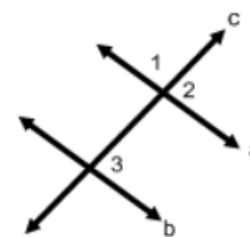
15) $\angle 7 \cong \angle 11$



Complete the following flow proof.

Given: $\angle 1$ and $\angle 3$ are supplementary

Prove: $a \parallel b$



$\angle 1$ and $\angle 3$ are supplementary
a. _____

d. _____
Supplements of the same angle are congruent

b. _____
Def. of a linear pair.

$\angle 1$ and $\angle 2$ are supplementary
c. _____

$a \parallel b$
e. _____

Algebra Review

Solve: $7 = 4x - 5$

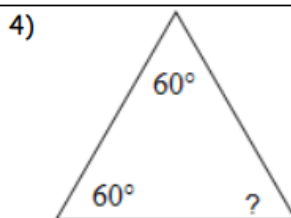
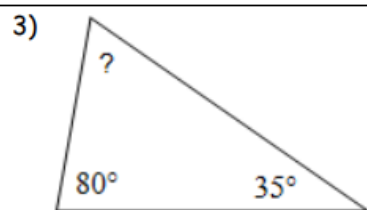
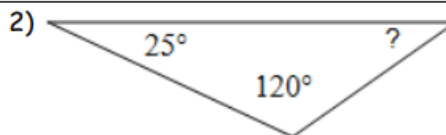
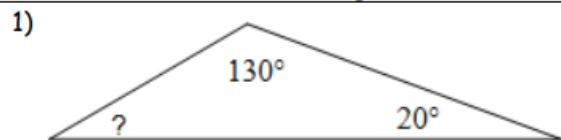
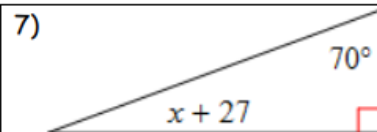
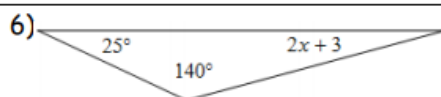
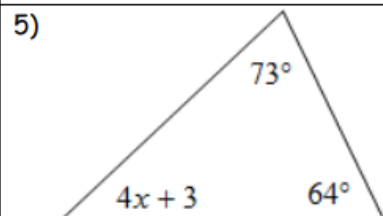
Solve: $10x - 16 = 2x + 8$

Multiply: $5x^2(2x^2 - 7)$

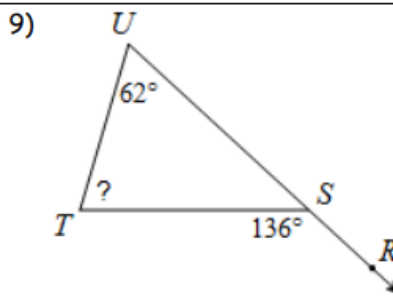
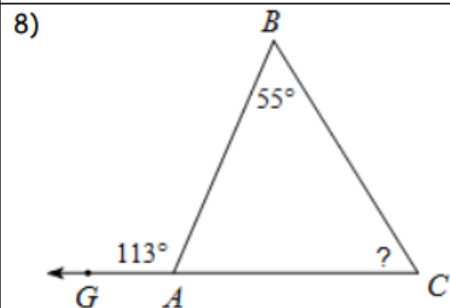
Parallel Lines and Triangles

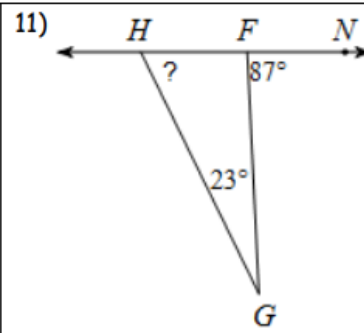
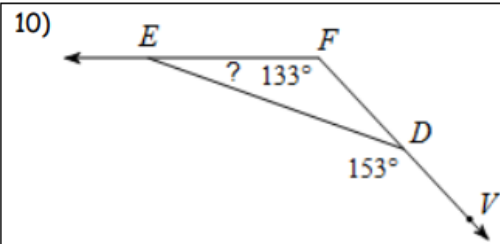
Hw Section 3.4

Find the measure of each angle indicated.

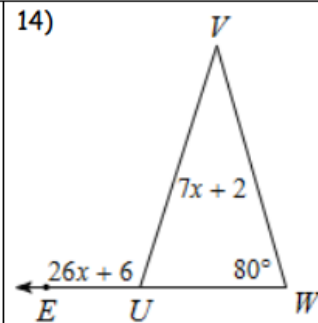
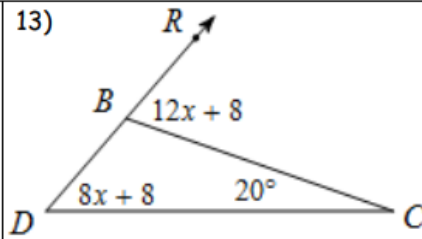
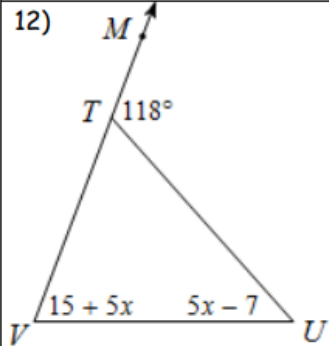
Directions: Solve for x .

Directions: Find the measure of each angle indicated.

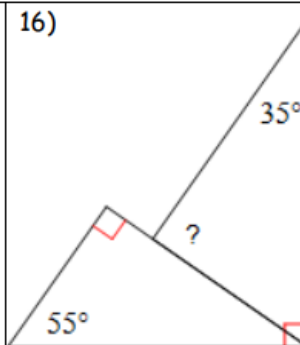
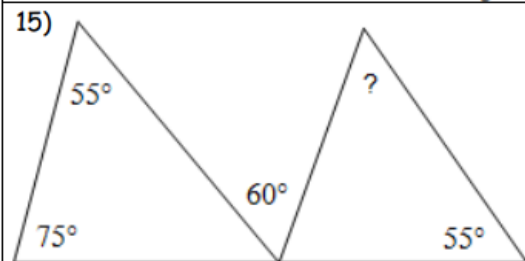




Directions: Solve for x.



Directions: Find the measure of each angle.



Algebra Review

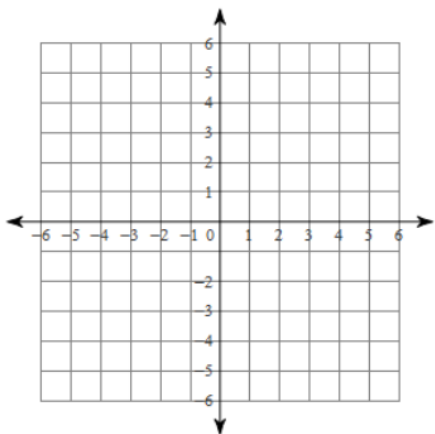
Solve: $7y - 18 = -4$

Solve: $5h - 2 = 2h + 10$

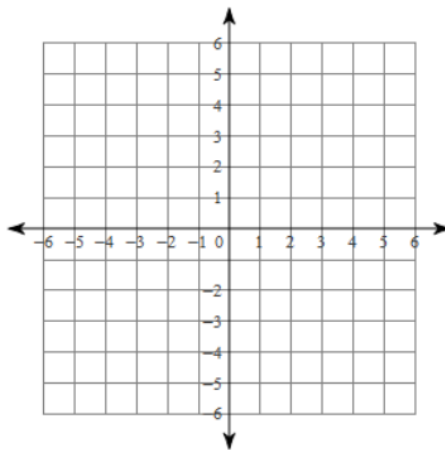
Multiply: $2x^2(3x^3 + 8x)$

Equations of Lines in the Coordinate Plane Hw Section 3.5

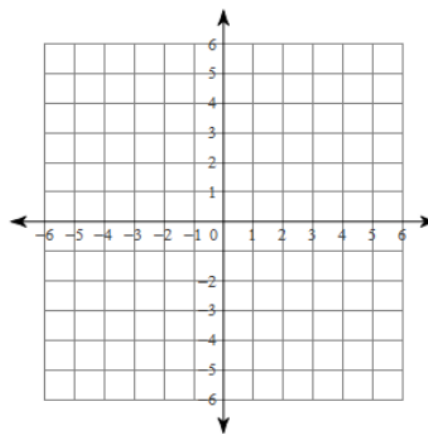
1) $y = \frac{3}{5}x - 2$



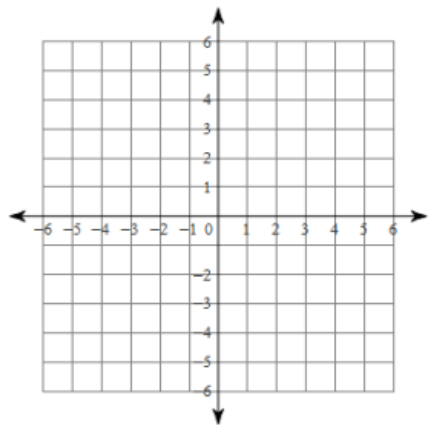
2) $y = -7x + 5$



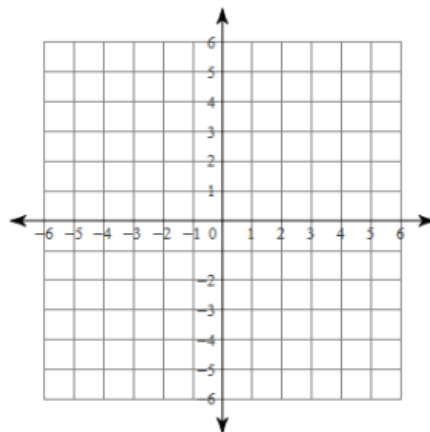
3) $y = \frac{3}{4}x$



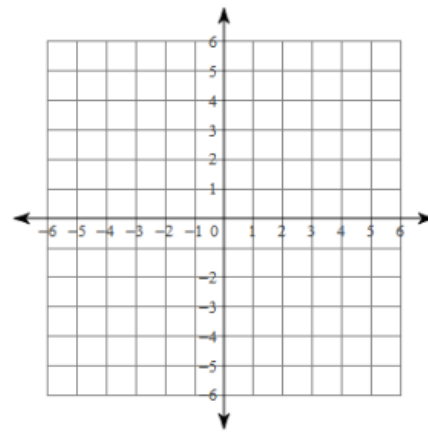
4) $y = -\frac{2}{3}x - 1$



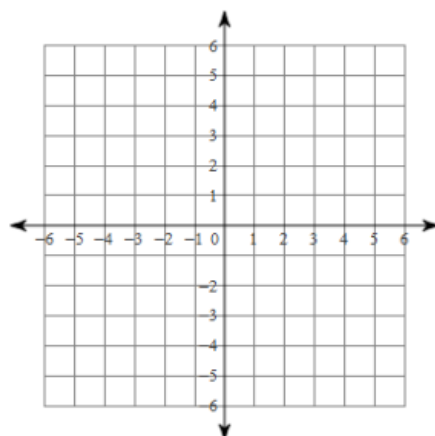
5) $y = -x - 1$



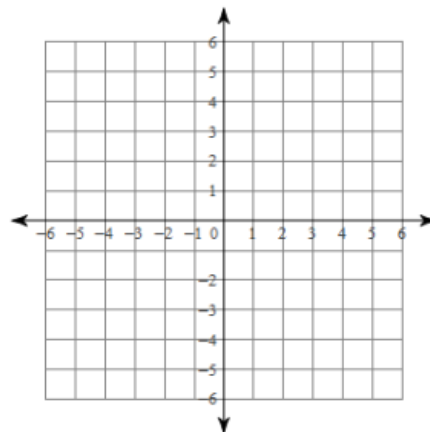
6) $y = -2x + 4$



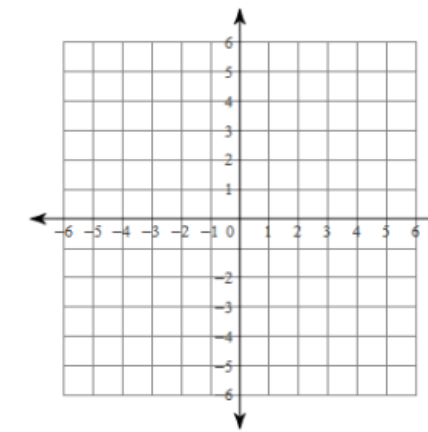
7) $y = -\frac{1}{2}x - 1$



8) $x = 1$



9) $y = 2$



Algebra Review

Solve: $-24 = 8 - 4k$

Solve: $12j + 15 = -13j - 35$

Multiply: $-5g(5g - 7)$

Directions: Write the equation of a line with the given information.

10) Slope = $\frac{7}{3}$, y-intercept = -3

11) through: $(0, -1)$, slope = $\frac{1}{2}$

12) through: $(4, 3)$, slope = 2

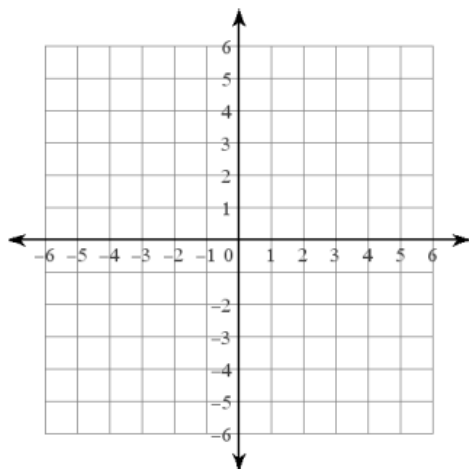
13) through: $(3, 4)$ and $(5, -2)$

14) through: $(3, 3)$ and $(2, -4)$

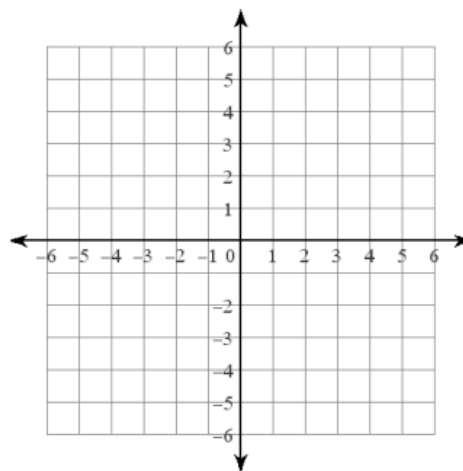
15) through: $(-2, 3)$ and $(0, 2)$

Factor: $36h^5 + 27h^4$

Graph: $y = \frac{1}{4}x - 3$



Graph: $y = -x$



Slopes of Parallel and Perpendicular Lines

Hw Section 3.6

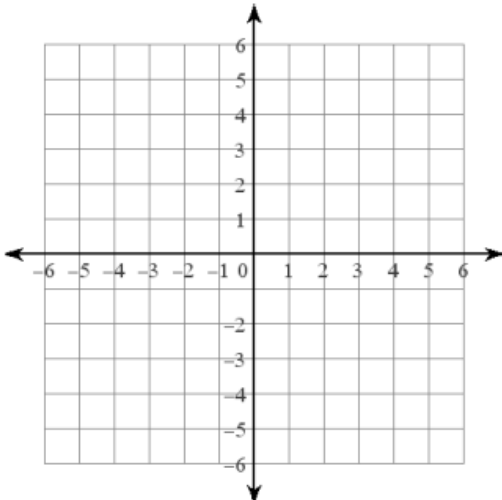
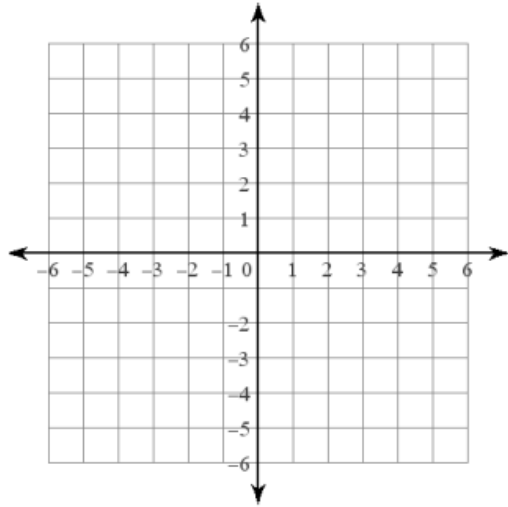
Directions: Write the equation of the line described.

1) through $(-2, 2)$, parallel to $y = -x - 2$	2) through $(-2, -3)$, parallel to $y = x - 3$	3) through $(-4, -5)$, parallel to $y = \frac{5}{2}x$
4) through $(-3, 1)$, perpendicular to $y = \frac{3}{4}x - 2$	5) through $(-3, -2)$, perpendicular to $y = -x - 4$	6) through $(-3, -5)$, perpendicular to $y = -3x - 5$

Directions: Determine whether the lines are parallel, perpendicular or neither.		
7) $2x - 7y = -42$ $4y = -7x - 2$	8) $y = 3$ $x = -2$	9) $2x + 5y = -1$ $10y = -4x - 20$
10) A parallelogram is a quadrilateral that has opposite sides that are parallel Is quadrilateral ABCD a parallelogram? .Why or why not? A(0,2), B(3,4), C(2,7) and D(-1,5)		

Algebra Review

Solve: $73 = 40 - 3k$	Solve: $7h + 15 = 3h - 27$	Multiply: $8n(7 - 5n)$
-----------------------	----------------------------	------------------------

Factor: $42p^3 + 28p$	Graph: $y = -\frac{2}{5}x$ 	Graph: $x = 4$ 
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End of Course Test Questions 2017

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

Question 31

Which term is defined as two intersecting lines that form four right angles in a plane?

- Ⓐ skew lines
- Ⓑ straight lines
- Ⓒ parallel lines
- Ⓓ perpendicular lines

End of Course Test Questions 2018

Question 15

Square ABCD has vertices at A (1, 2) and B (3, -3).

What is the slope of \overline{BC} ?

Question 9

Line k has a slope of -5 . Line j is perpendicular to line k and passes through the point (5, 9).

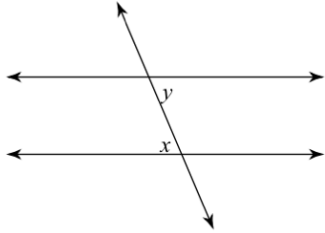
Create the equation for line j .

Transversals

Chapter 3 Review 1

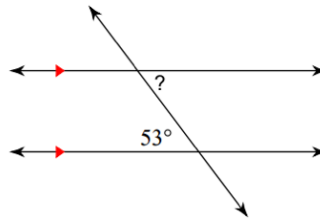
Identify each pair of angles as corresponding, alternate interior, alternate exterior, or same-side interior. (2 points each)

1)



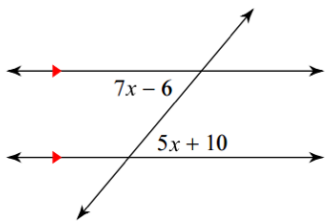
Find the measure of each angle indicated.(5 points)

2)



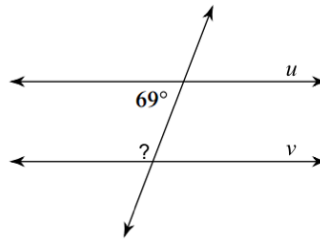
Solve for x .(5 points each)

3)



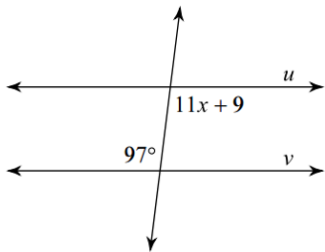
Find the measure of the indicated angle that makes lines u and v parallel.(5 points each)

4)

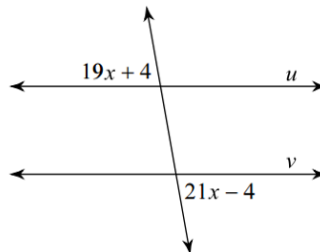


Find the value of x that makes lines u and v parallel.(5 points each)

5)

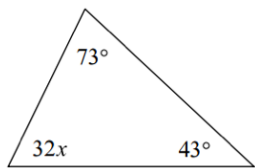


6)

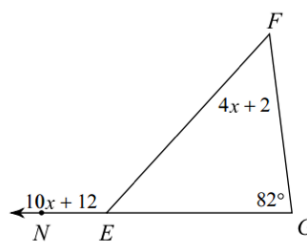


Solve for x .(5 points each)

7)



8)



Write the equation of a line from the given information.

9) through: $(-2, 5)$ and $(0, -3)$

10) through: $(-4, 2)$, perp. to $y = \frac{4}{5}x + 4$

ALGEBRA REVIEW: Solve each equation. (1 point each)

11) $\frac{k}{4} - 3 = -4$

12) $p - 5 = 3p + 9$

ALGEBRA REVIEW: Find each product. (1 point each)

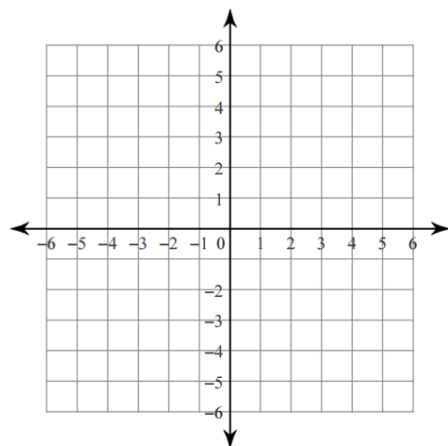
13) $-4k^3(-k + 6)$

ALGEBRA REVIEW: Factor the common factor out of each expression. (1 point each)

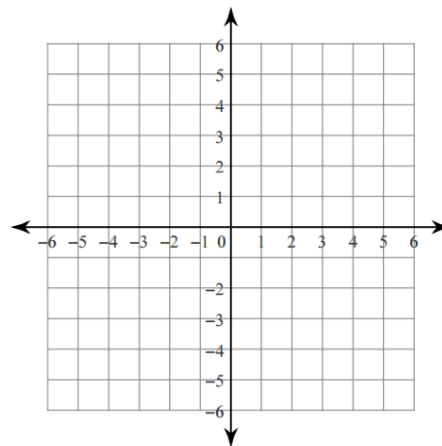
14) $48n^4 + 6n^3$

ALGEBRA REVIEW: Sketch the graph of each line.(1 point each)

15) $y = -\frac{1}{5}x + 2$



16) $y = -5$



Unit 3 REVIEW Application/Extensions

- 1) In one triangle one of the angles is four times the measure of another and the third angle is five times as much as that angle. What are the measures of all three angles? (5 points)

- 2) Mr. Kelly eats jelly beans out of a jar on his desk. After 1 week he has 9 jelly beans. After 3 weeks he has 3 jelly beans. (2 points each)

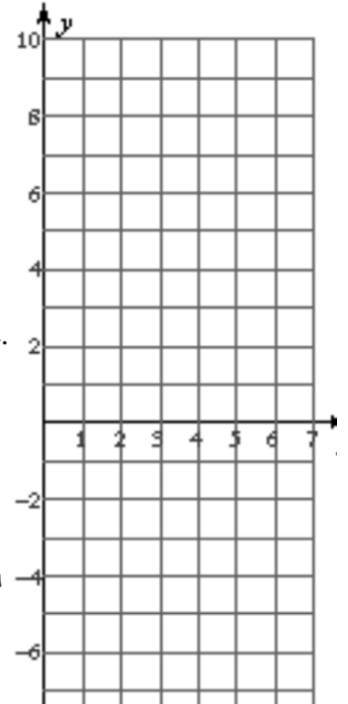
a) What's Mr. Kelly's slope (rate of change) for this situation?

b) What's Mr. Kelly's y-intercept (initial value) for this situation?

c) Write an equation of the line for the given situation. Graph the line.

d) How much money would Mr. Kelly have after 2 months?

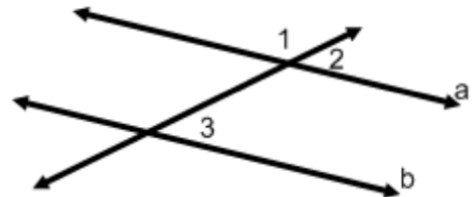
e) Mr. Brust has a line that is parallel to Mr. Kelly's but he starts with 20 jelly beans. What is the equation of the line for Mr. Brust?



- 3) Complete a flow proof or two-column proof for the following.

Given: $\angle 1$ and $\angle 3$ are supplementary

Prove: $a \parallel b$

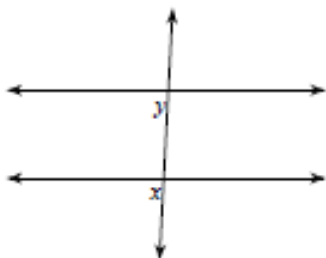


Transversals

Chapter 3 Review 2

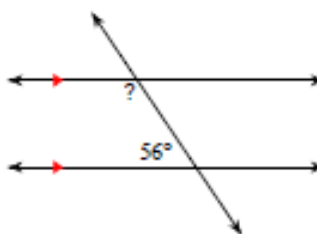
Identify each pair of angles as corresponding, alternate interior, alternate exterior, or same-side interior. (2 points each)

1)



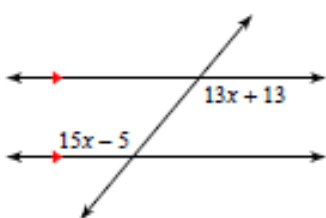
Find the measure of each angle indicated.(5 points)

2)



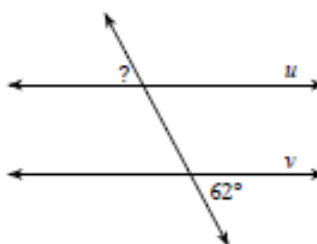
Solve for x .(5 points each)

3)



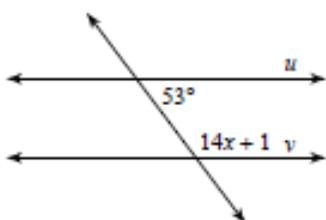
Find the measure of the indicated angle that makes lines u and v parallel.(5 points each)

4)

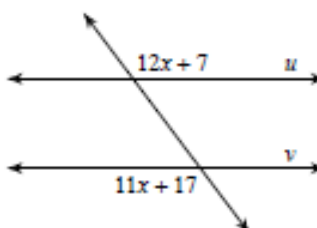


Find the value of x that makes lines u and v parallel.(5 points each)

5)

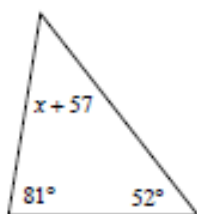


6)

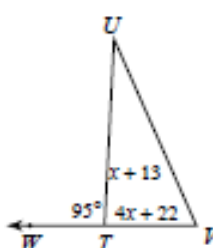


Solve for x .(5 points each)

7)



8)



Write the equation of a line with the given information.

16) Slope = $\frac{5}{4}$, y-intercept = -4

17) through: $(-5, 3)$ and $(1, 5)$

18) through: $(3, 2)$, parallel to $y = \frac{2}{3}x - 1$

19) through: $(-5, -4)$, perp. to $y = -\frac{5}{9}x - 2$

ALGEBRA REVIEW: Solve each equation. (1 point each)

20) $-40 = 8 + 4p$

21) $2p - 8p = -2p + 16$

ALGEBRA REVIEW: Find each product. (1 point each)

22) $-2n(-5n + 6)$

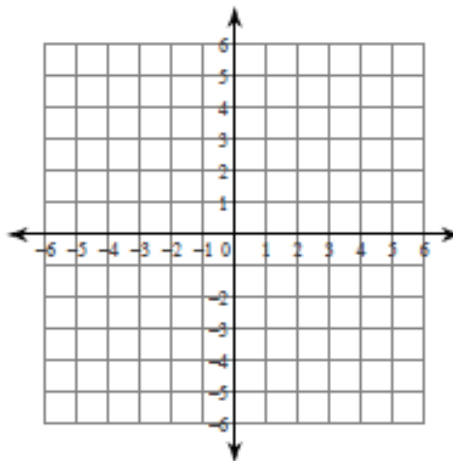
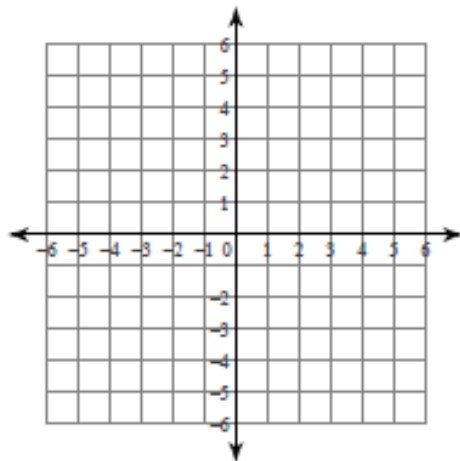
ALGEBRA REVIEW: Factor the common factor out of each expression. (1 point each)

23) $-4b - 40b^{10}$

ALGEBRA REVIEW: Sketch the graph of each line.(1 point each)

24) $y = 2x + 2$

25) $y = 2$



Unit 3 CA Application/Extension

1) In another triangle one angle has $(x + 5)^\circ$ and the other two angles are three times and eight times that angle. How many degrees are in each angle?

2) Mr. Kelly is trying to make some cash for his favorite hobby, collecting Barbie dolls. After one week he still owes his wife one dollar but after three weeks he has now five dollars.

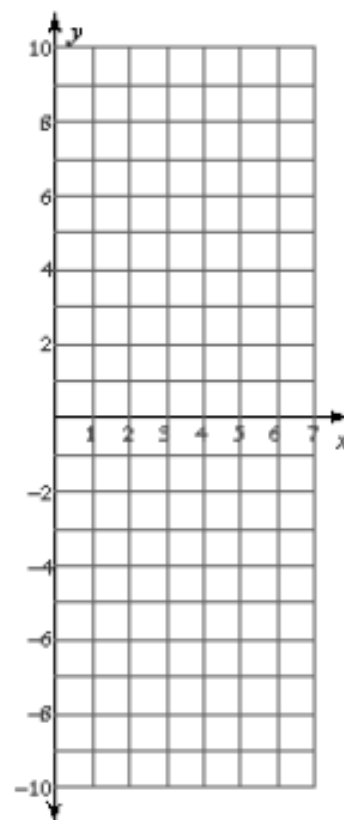
a) What's Mr. Kelly's slope (rate of change) for this situation?

b) What's Mr. Kelly's y-intercept (initial value) for this situation?

c) Write an equation of the line for the given situation. Graph the line.

d) How much money would Mr. Kelly have after 2 months?

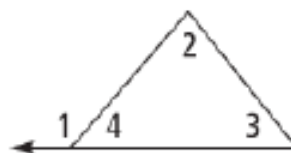
4) Mr. Brust has a line that is parallel to Mr. Kelly's but he starts with \$2. What is the equation of the line for Mr. Brust?



5) Use a two column proof to prove the following.

Given: $\angle 1$ is an exterior angle of the triangle.

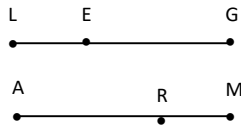
Prove: $m\angle 1 = m\angle 2 + m\angle 3$



Tools, Proofs & Transversals Quarter 1 Review 1

1. Part of a proof is shown. Place statements and reasons in the table to complete the proof.

Given $\overline{LE} \cong \overline{MR}$, $\overline{EG} \cong \overline{RA}$
 Prove $\overline{LG} \cong \overline{MA}$



Statement	Reason
-----------	--------

- | | |
|--|---|
| a. _____ | a. Given |
| b. $LE = MR$
$EG = RA$ | b. _____ |
| c. $LG = LE + EG$
$MA = MR + RA$ | c. _____ |
| d. $LG = MR + RA$ | d. Substitution Property of Equality (double) |
| e. _____ | e. Substitution Property of Equality |
| f. $\overline{LG} \cong \overline{MA}$ | f. _____ |

2		
3		
4		$\frac{g}{cm^3}$
5		
6		
7		people per square mile (Round your answer to the nearest tenth.)
8		
9		

2. Which term is defined as an angle formed by two opposite rays?
- A. Straight angle
 - B. Vertical angle
 - C. Corresponding angle
 - D. Complementary angle

3. Kevin asked Olivia what the Supplement Theorem is. Olivia responded, " $m\angle 1 + m\angle 2 = 180$." What definition did Olivia actually give?

- A. Definition of a straight angle
- B. Definition of supplementary angles
- C. Definition of complementary angles
- D. Definition of transversal

4. Jeremy wants to know the density of a rock in grams per cubic centimeter. The rock has a mass of 4.45 kilograms and a volume of 508 cubic centimeters. What is the density of the rock, in grams per cubic centimeter $\left(\frac{g}{cm^3}\right)$?

_____ $\frac{g}{cm^3}$

5. Line k has a slope of 4. Line j is perpendicular to line k and passes through the point $(-2, 8)$. Create the equation for line j .

6. \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 $\frac{AB}{BC}$?

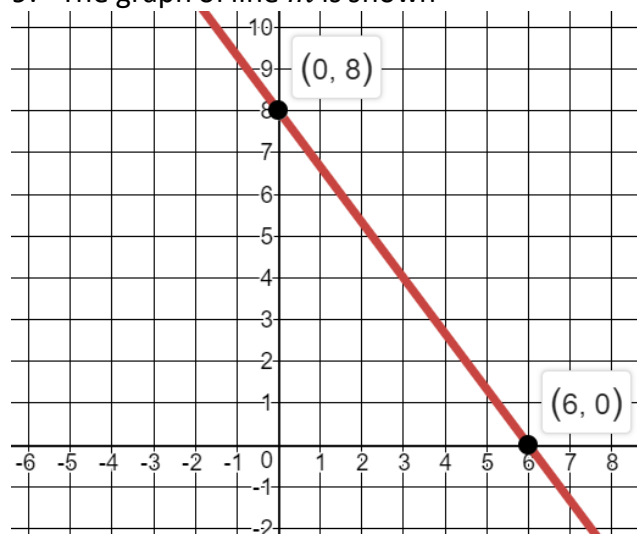
7. A study reports that in 2010 the population of the United States was 308,745,538 people and the land area was approximately 3,531,905 square miles.

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.

_____ people per square mile

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

9. 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 $(-2, 4)$?

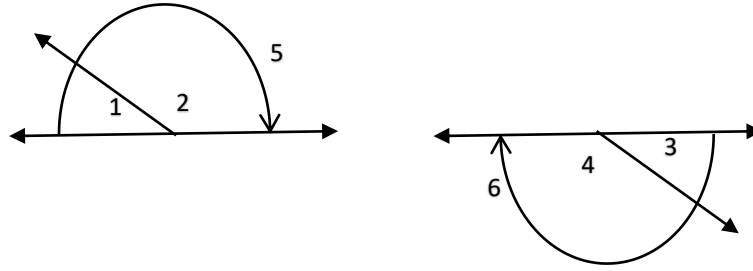
Tools, Proofs & Transversals

Quarter 1 Review 2

1. Part of a proof is shown. Place statements and reasons in the table to complete the proof.

Given $\angle 1 \cong \angle 3$

Prove $\angle 2 \cong \angle 4$



Statement	Reason
a. $\angle 1 \cong \angle 3$	a. _____
b. $m\angle 1 = m\angle 3$	b. _____
c. $\angle 1$ and $\angle 2$ are linear pair $\angle 3$ and $\angle 4$ are linear pair	c. _____
d. $\angle 1$ and $\angle 2$ are Supplementary $\angle 3$ and $\angle 4$ are Supplementary	d. _____
e. $m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 3 + m\angle 4 = 180^\circ$	e. _____
f. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	f. _____
g. $m\angle 3 + m\angle 2 = m\angle 3 + m\angle 4$	g. _____
h. $m\angle 2 = m\angle 4$ $\angle 2 \cong \angle 4$	h. _____
ii.	i. _____

2	
3	
4	$\frac{g}{cm^3}$
5	
6	
7	people per square mile (Round your answer to the nearest tenth.)
8	
9	

2. Which term is defined as nonadjacent angles formed by two intersecting lines?
- Straight angle
 - Vertical angle
 - Corresponding angle
 - Complementary angle
3. Kevin asked Olivia what the Alternate Interior Angles Theorem is. Olivia responds, "When a transversal intersects two lines, the alternate interior angles are congruent." What is wrong with Olivia's responds?
- She should have said the alternate interior angles are supplementary, instead of congruent.
 - She should have said the alternate interior angles are complementary, instead of congruent.
 - She should have said the transversal intersects two parallel lines.
 - She should have said the transversal intersects two perpendicular lines.
4. Jeremy wants to know the density of a pop tart in grams per cubic centimeter. The pop tart has a mass of 0.00183 kilograms and a volume of 97 cubic centimeters. What is the density of the pop tart, in grams per cubic centimeter $\left(\frac{g}{cm^3}\right)$?
- _____ $\frac{g}{cm^3}$
5. Line k has a slope of $-\frac{2}{3}$. Line j is perpendicular to line k and passes through the point $(-4, -5)$. Create the equation for line j .

6. \overline{AC} has endpoints $A(3, 4)$ and $C(6, 8)$. Point B is on \overline{AC} and is located at $(4.5, 6)$. What is the ratio of $\frac{AB}{BC}$?

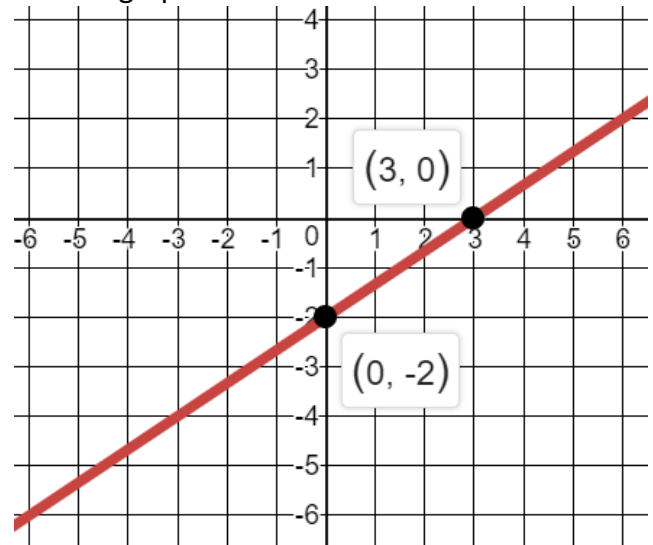
7. A study reports that in 2016 the population of the Gnadon was 1,283 people and the land area was approximately 0.96875 square miles.

Based on the study, what was the population density, in people per square mile, of the United States in 2016? Round your answer to the nearest tenth.

_____ people per square mile

8. Square ABCD has vertices at A(8, -2) and B(5, -6). What is the slope of \overline{CD} ?

9. The graph of line m is shown



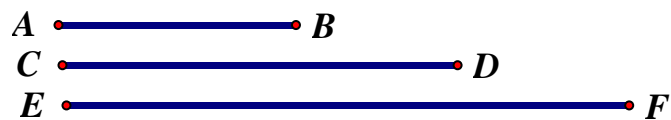
What is the equation of the line that is perpendicular to line m and passes through the point $(4, -2)$?

Constructions – Segments & Angles

Hw Section A.1 **G.CO.D.12**

COPYING A SEGMENT

1. Given \overline{AB} , \overline{CD} , & \overline{EF} . Use the copy segment construction to create the new lengths listed below.



3AB



CD + EF



2CD + 1AB

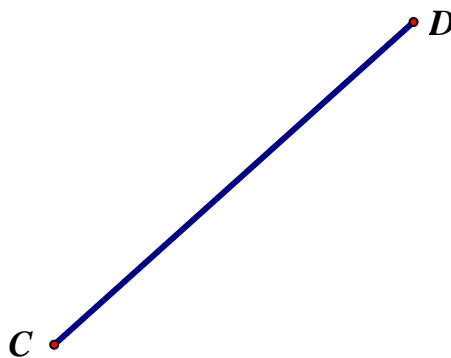


EF - CD



CONSTRUCTING A MIDPOINT

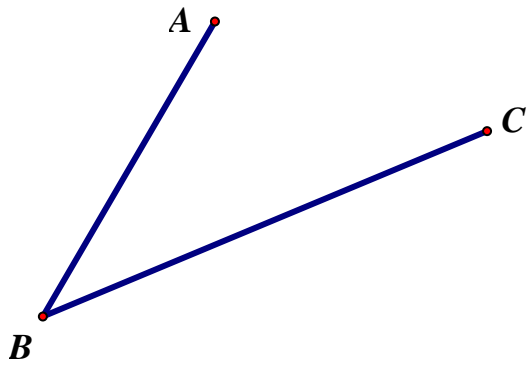
2. Given \overline{AB} & \overline{CD} . Use the midpoint construction to find the midpoint of \overline{AB} & \overline{CD} .



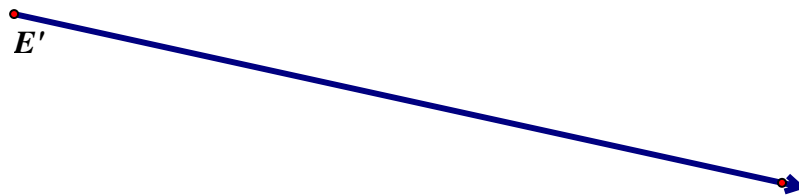
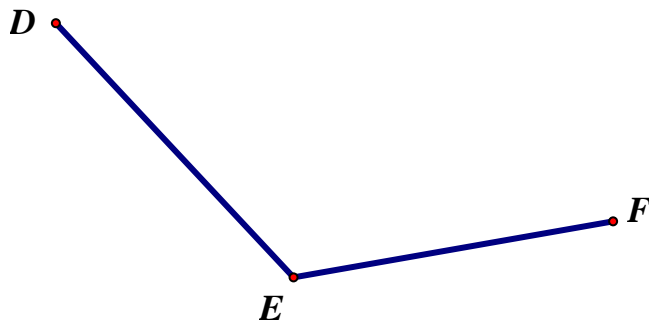
3. Use your midpoint construction to determine the exact length of $\frac{1}{4}EF$

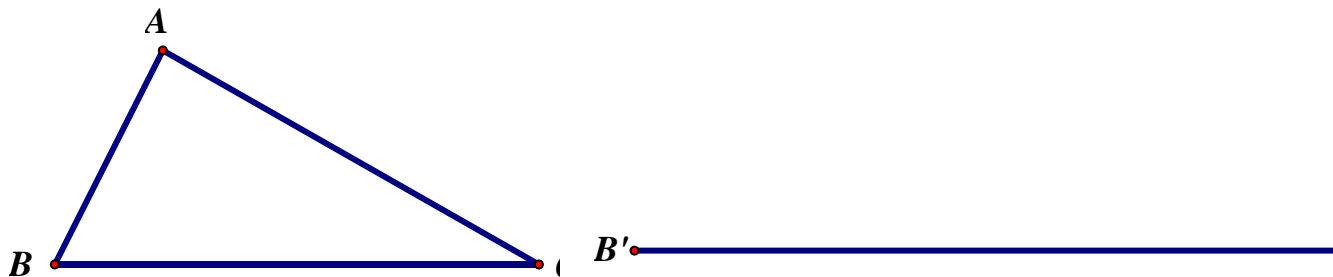


4. Given $\angle ABC$. Make a copy of $\angle ABC$, $\angle A'B'C'$.

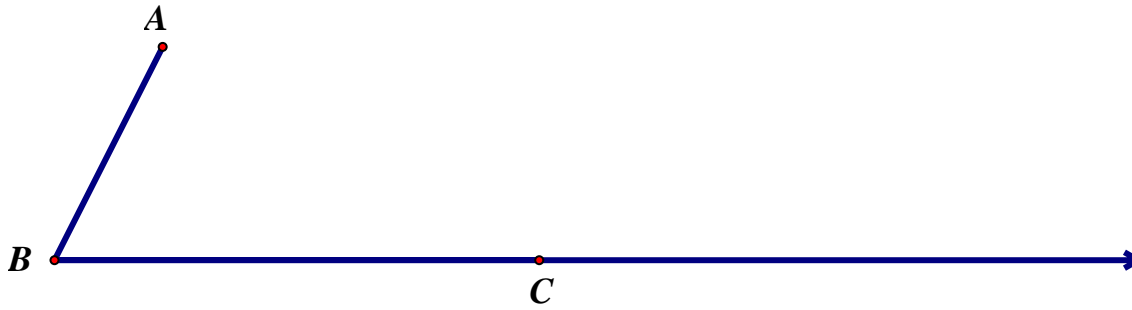


5. Given $\angle DEF$. Make a copy of $\angle DEF$, $\angle D'E'F'$.

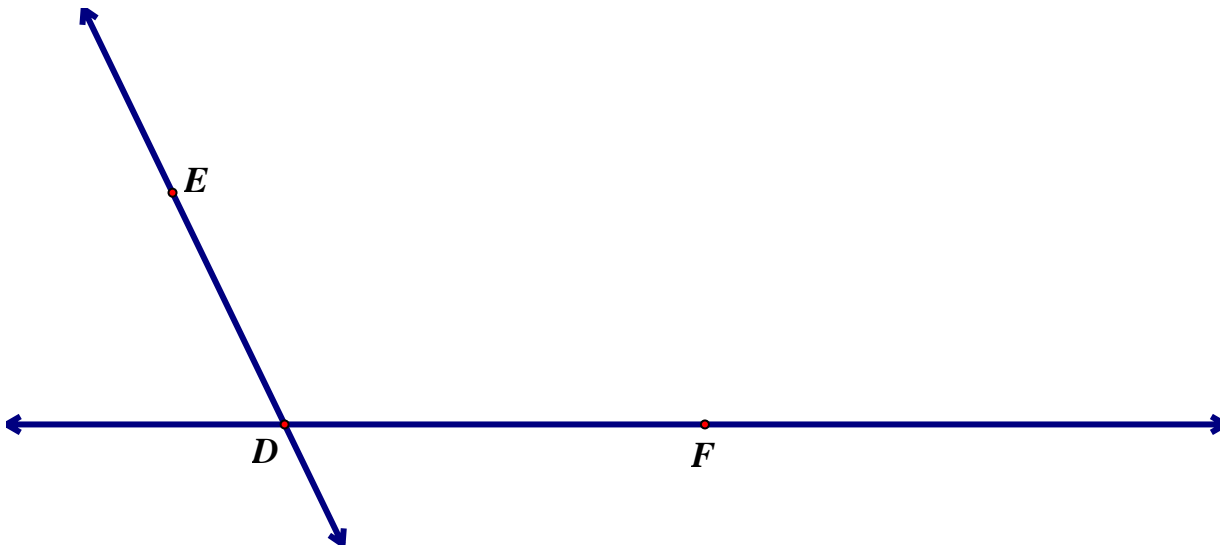


PRACTICE - CONSTRUCTION BASICS #11. Given \overline{MN} , construct $2.5 MN$ 2. Given \overline{GH} , construct $1.75 GH$ 3. Given $\triangle ABC$, construct a copy of it, $\triangle A'B'C'$.

4. Given $\angle ABC$, can you think of a way to create a line parallel to \overleftrightarrow{AB} through point C ?
(Hint: How could copying an angle help you?)



5. Create a parallel line to \overleftrightarrow{DE} through point F .

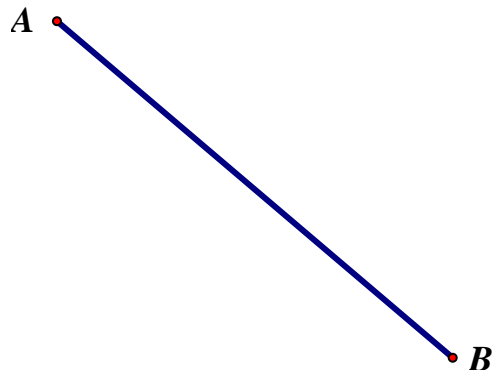


Perpendiculars & Bisectors

Hw Section A.2

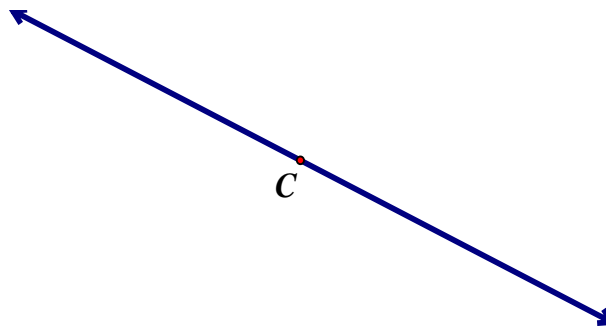
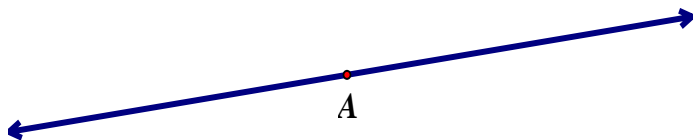
Constructing the Perpendicular Bisector (a \perp line through the midpoint of a segment).

1. Given \overline{AB} . Use the midpoint construction to construct the perpendicular bisector.



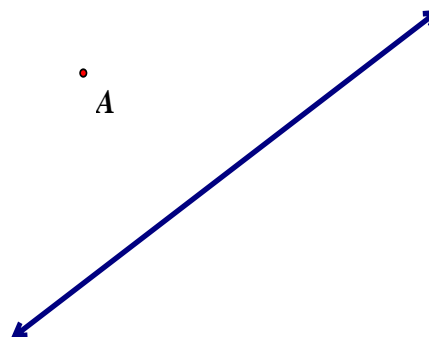
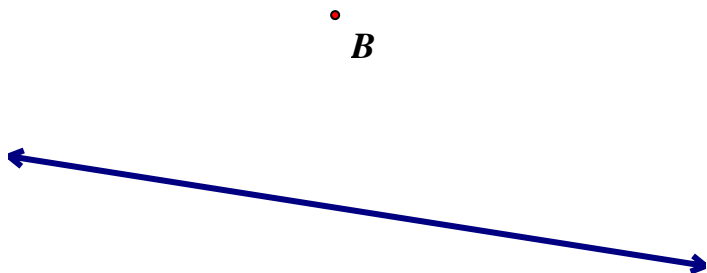
Construct the perpendicular line THROUGH A POINT ON THE LINE.

2. Work backwards from the midpoint construction.



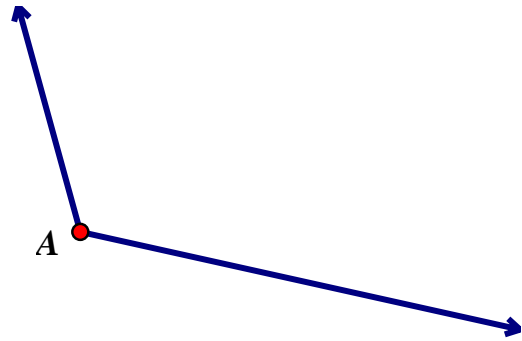
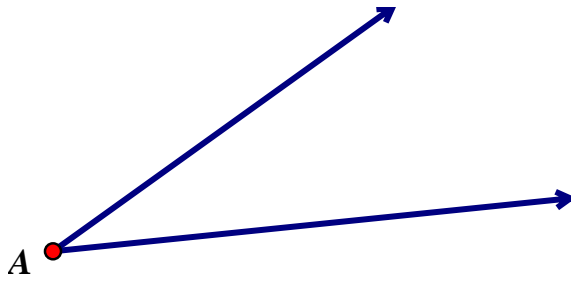
Construct the perpendicular line THROUGH A POINT not on THE LINE.

3. Work backwards through the midpoint construction.



Construct the angle bisector.

4. Given $\angle A$, construct the angle bisector, \overrightarrow{AD}

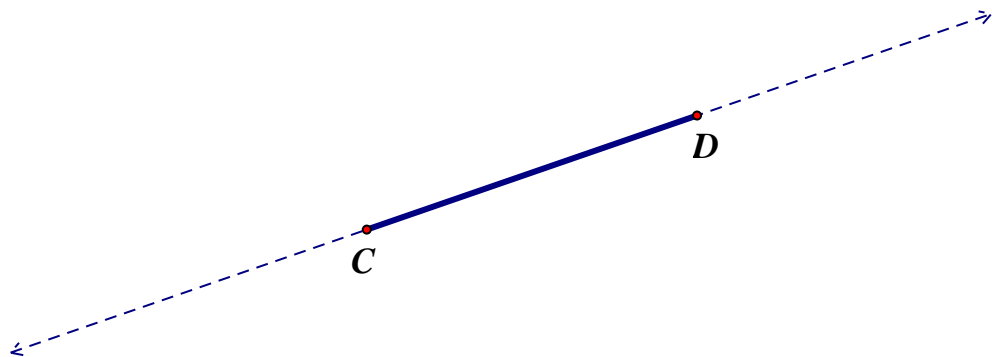


5. Given sides of a rectangle. Construct the rectangle.

Hint - We need perpendicular lines through A and through B.



6. Given the side of a square. Construct the square.



End of Course Test Questions 2019

Question 21

Trisha wants to create the perpendicular bisector of line segment AB .

She places her compass on point A and opens it with the width equal to the length of the line segment AB . She makes arcs above and below the line segment.

What could be Trisha's next step to create the perpendicular bisector of line segment AB ?

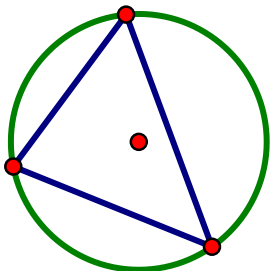
- Ⓐ connect the two arcs using a straightedge
- Ⓑ connect each arc with point B using a straightedge
- Ⓒ place the compass on the approximate midpoint and draw intersecting arcs
- Ⓓ place the compass on point B and complete the same steps that she did for point A

Inscribed Polygons

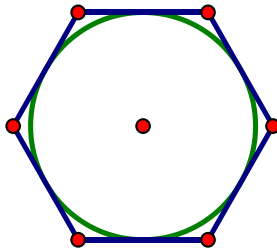
Hw Section A.3

1. Determine whether the relationships is **INSCRIBED** or **CIRCUMSCRIBED**.

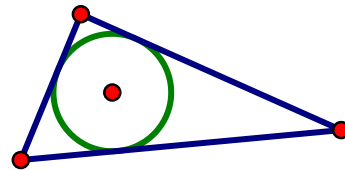
a) The triangle is _____.



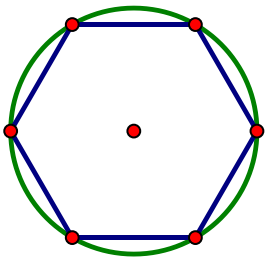
b) The hexagon is _____.



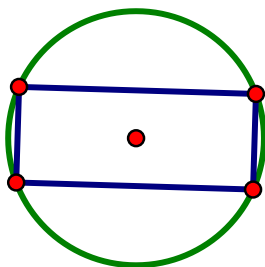
c) The circle is _____.



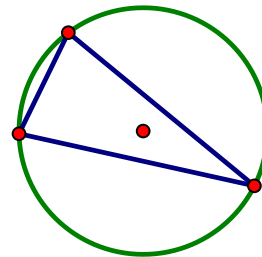
d) The hexagon is _____.



e) The circle is _____.

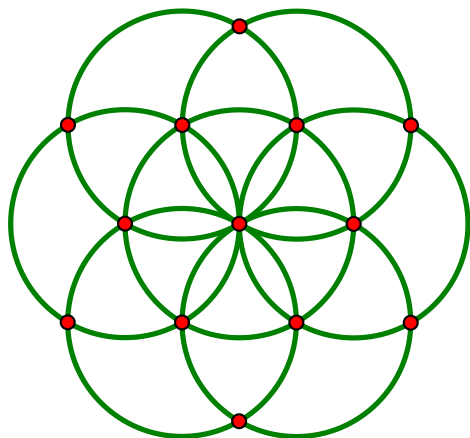


f) The triangle is _____.

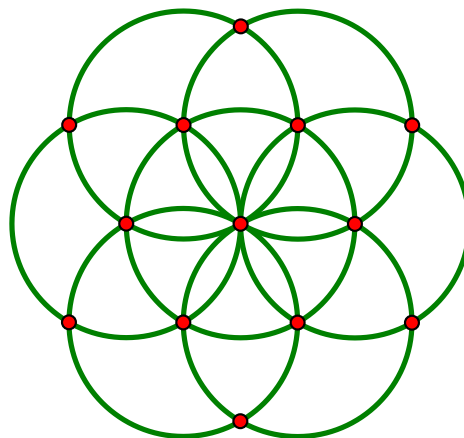


2. Jeff uses his compass to make a cool design. He just keeps creating congruent circles... over and over...

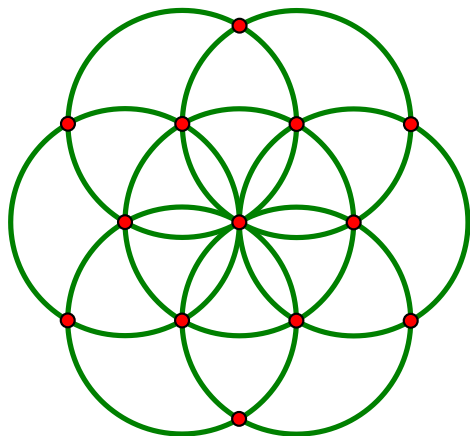
a) Find a regular hexagon (shade it in)



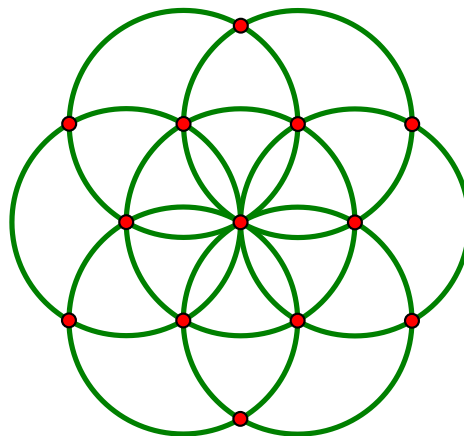
b) Find a different regular hexagon (shade it in)



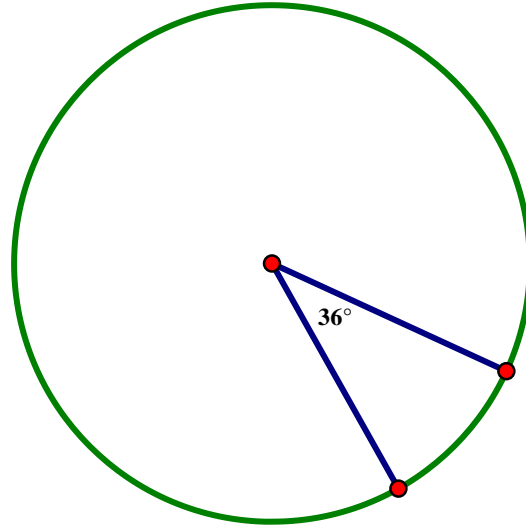
c) Find an equilateral triangle (shade it in)



d) Find a different equilateral triangle (shade it in)

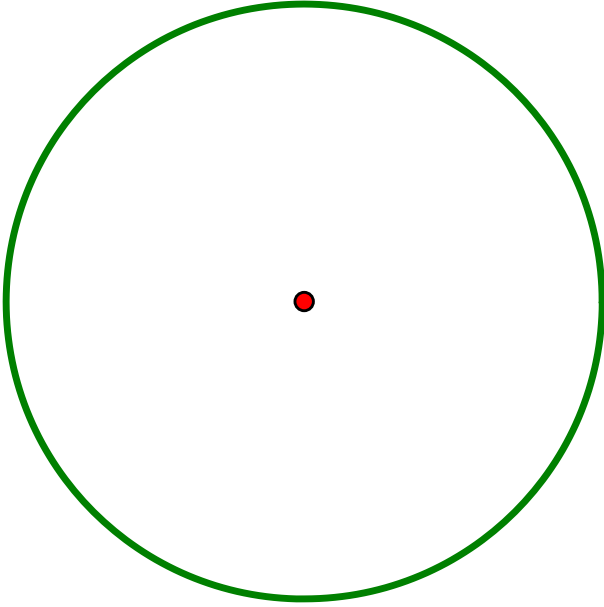


3. The inscribed equilateral triangle has a central angle of 120° because $360^\circ / 3 = 120^\circ$, an inscribed square has a central angle of 90° because $360^\circ / 4 = 90^\circ$. The central angle of a decagon is 36° because $360^\circ / 10 = 36^\circ$. Use this information and a compass to create an inscribed decagon.

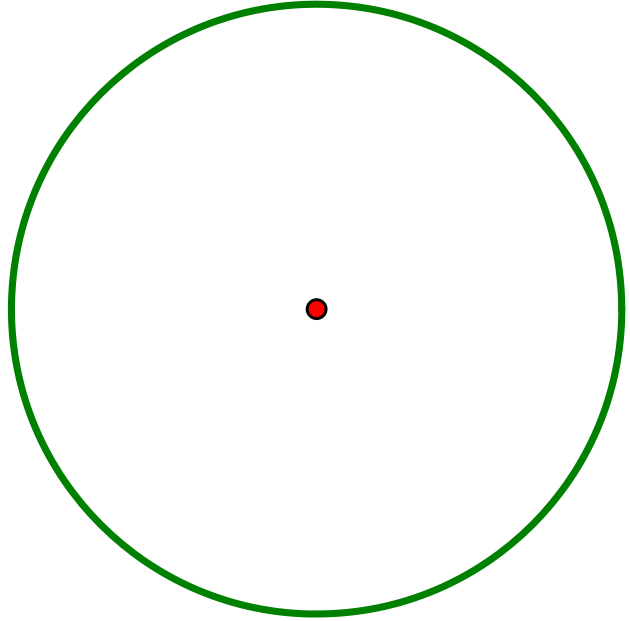


4. Construct the requested inscribed polygons.

a) Construct an equilateral triangle inscribed in the provided circle using your compass and straightedge.

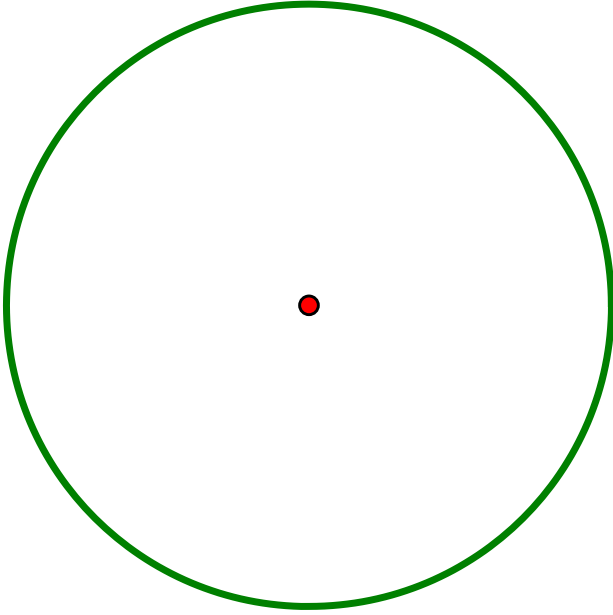


b) Construct a square inscribed in the provided circle using your compass and straightedge.

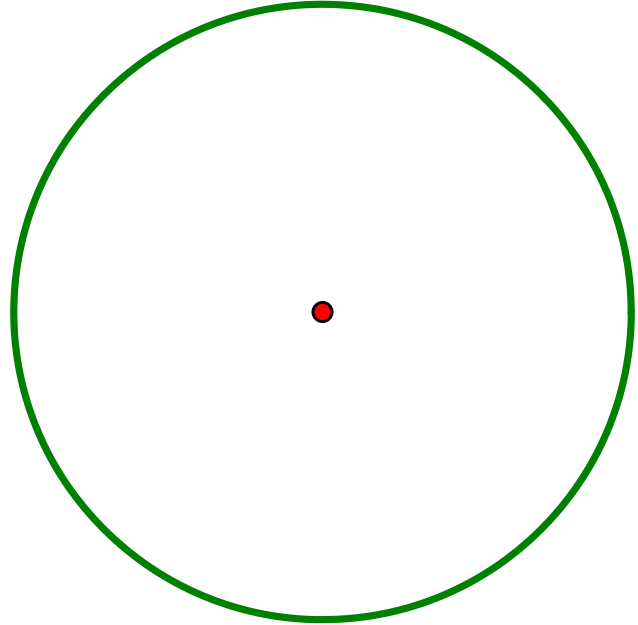


5. Construct the requested inscribed polygons.

a) Construct a regular hexagon inscribed in the provided circle using your compass and straightedge.



b) Construct a regular octagon inscribed in the provided circle using your compass and straightedge.



Hint: The central angle is 45° , half of the square's central angle of 90° .

Inscribed Polygons

Hw Section A.3 Part 2

Review the basic constructions.

1. Copying Segments



a) $4AB - CD$

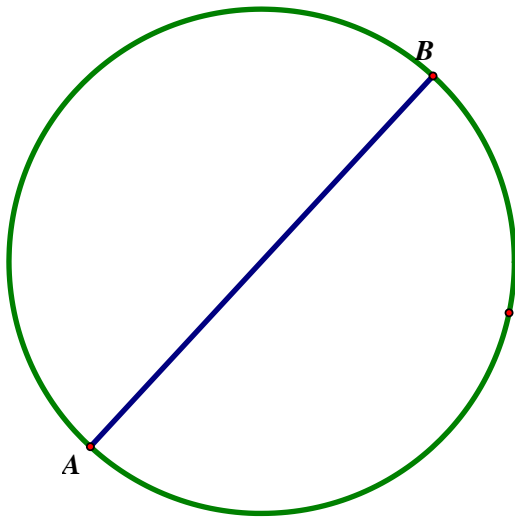


b) $2.75CD + AB$

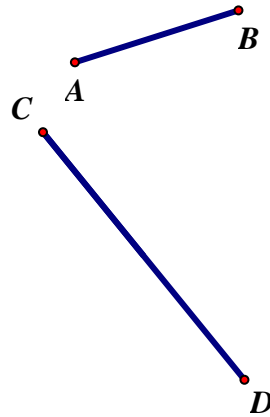


2. Midpoint Construction

a) Given diameter AB, find the center

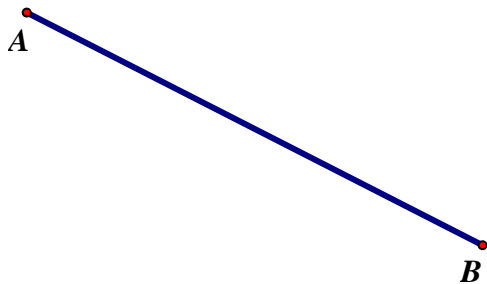


b) Which is larger AB or $\frac{1}{2}CD$? _____



Copy them here to compare them

c) Construct the midpoint of \overline{AB}

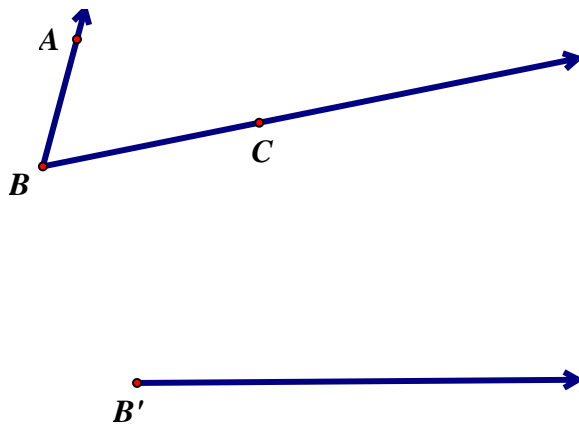


d) $CD = \frac{1}{3}GH$. Construct \overline{GH} .

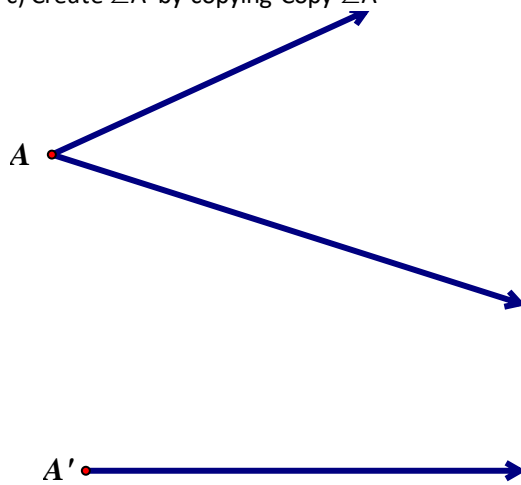


3. Copying an Angle & Parallel Line Construction

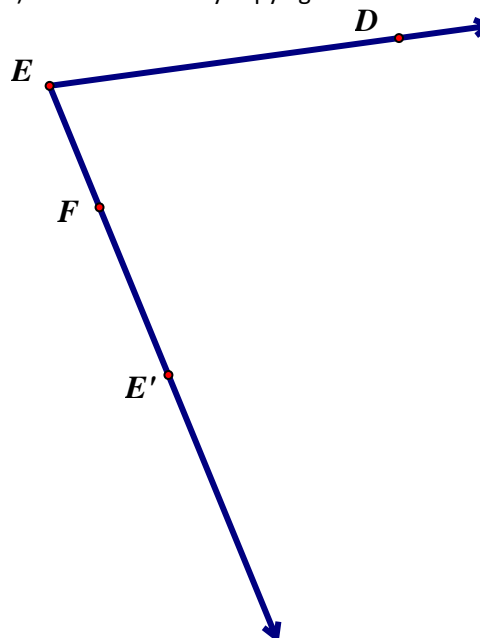
a) Create $\angle A'B'C'$ by copying $\angle ABC$.



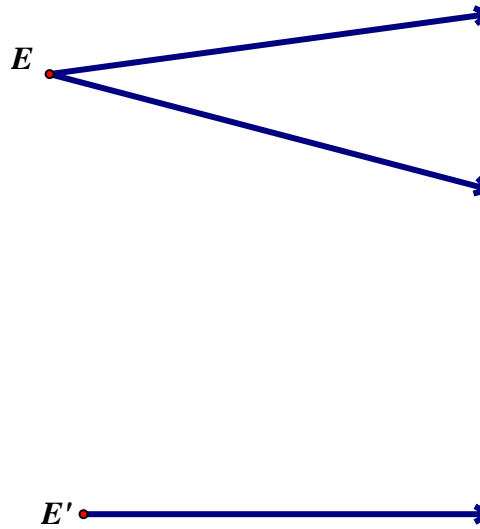
c) Create $\angle A'$ by copying Copy $\angle A$



b) Create $\angle D'E'F'$ by copying $\angle DEF$.

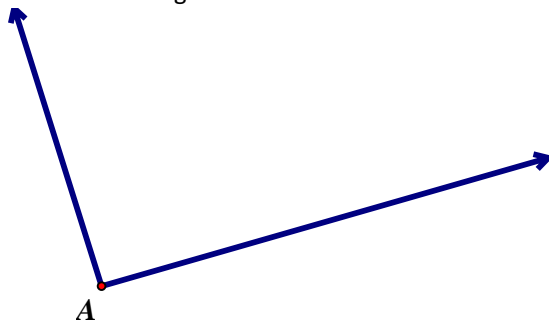


d) Create $\angle E'$ such that $m\angle E' = 2(m\angle E)$

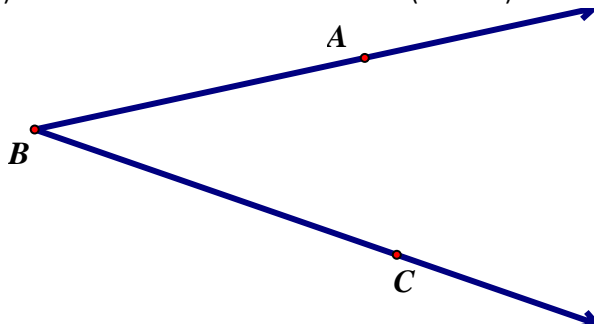


4. Angle Bisector Construction

a) Construct the angle bisector of $\angle A$.



b) Create $\angle DBC$ such that $m\angle DBC = \frac{1}{2} (m\angle ABC)$



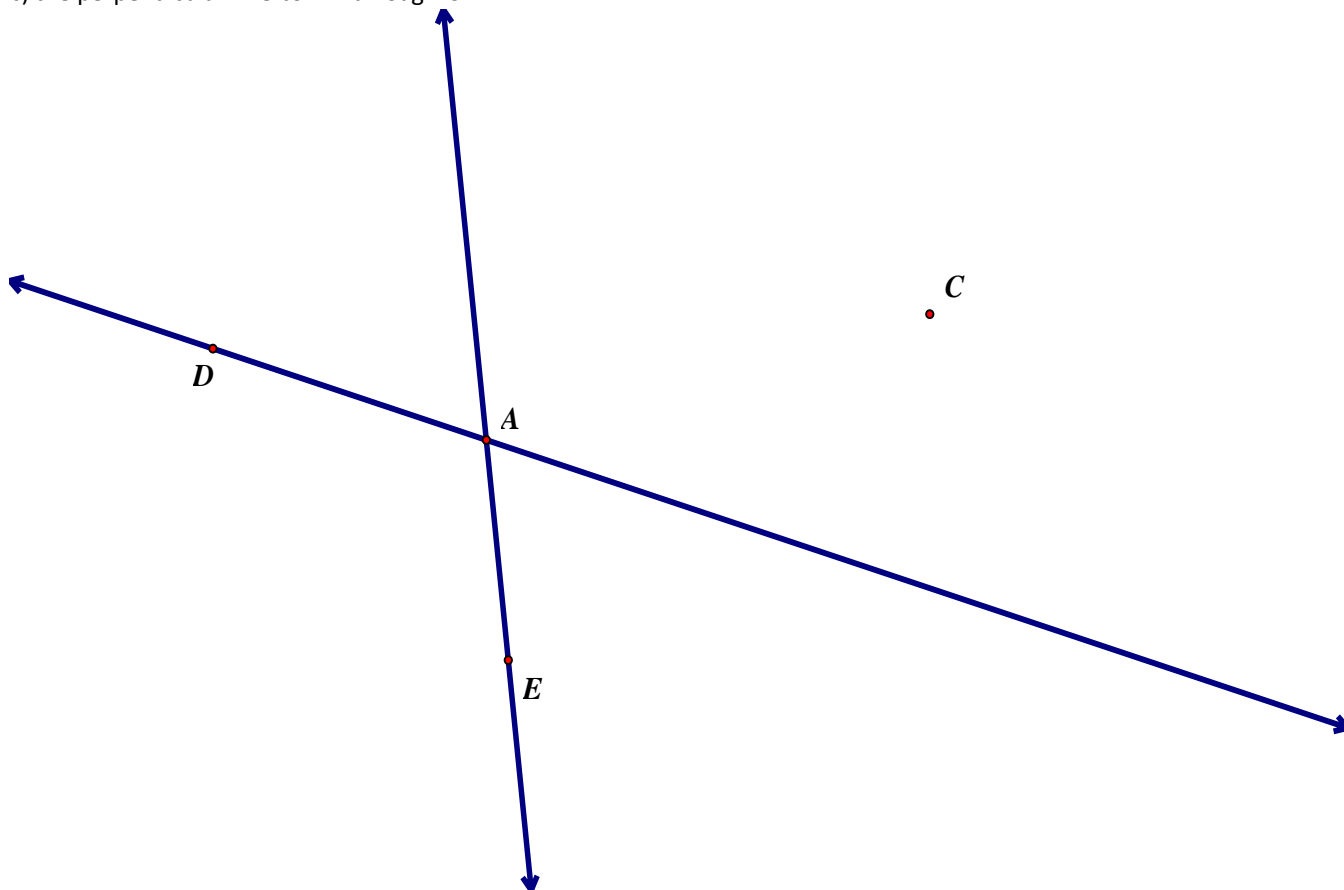
5. Perpendicular Constructions

Construct the following.

a) the perpendicular bisector of \overline{AD}

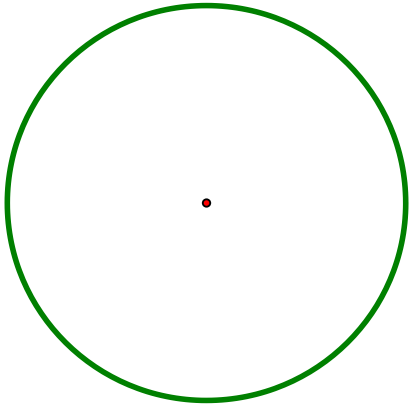
c) the perpendicular line to \overline{DA} through C

b) a perpendicular line to \overline{AE} through E

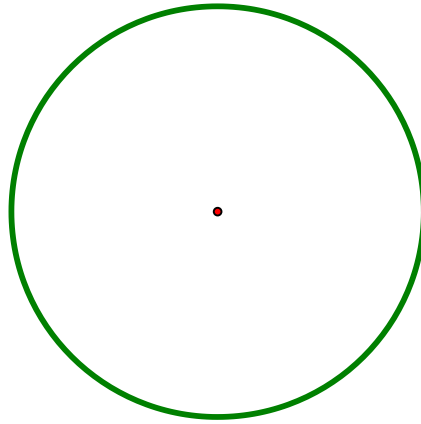


6. Inscribed Polygons

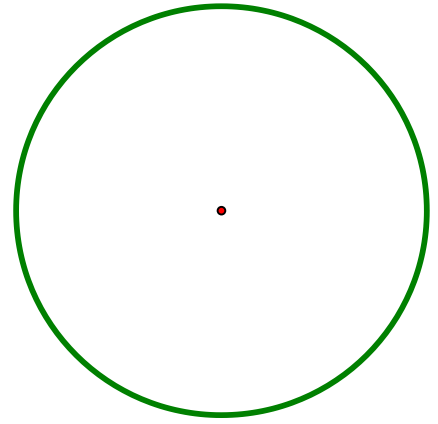
a) Inscribed Square



b) Inscribed Equilateral Triangle


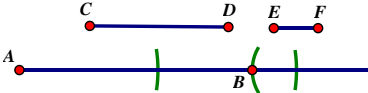
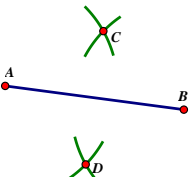
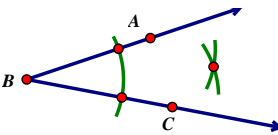
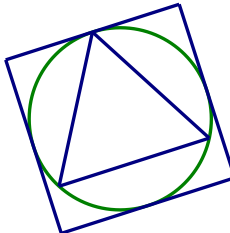


c) Inscribed Hexagon

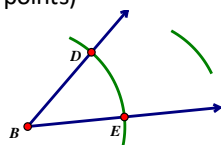


Constructions

Chapter A Review

<p>1. What is the best description for the distance from Point A to Point B?</p> <p>A) \overline{AB} B) AB</p> <p>C) about 2 cm D) about 1.5 inches</p>	 <p>1. _____</p>
<p>2. What is the best description for the distance from Point A to Point B?</p> <p>A) $CD + 2EF$ B) $CD - EF$</p> <p>C) $2CD - EF$ D) $2CD + EF$</p>	 <p>2. _____</p>
<p>3. A teacher finds a paper on the ground in the classroom. When she looks at it carefully she realizes it is from her geometry class because it has a construction on it. Choose all of the following constructions found directly from this student's work.</p> <p>A) The midpoint of \overline{AB} B) The perpendicular bisector of \overline{AB}</p> <p>C) A perpendicular line to \overline{AB} D) The angle bisector of $\angle CAB$</p>	 <p>3. _____</p>
<p>4. Which construction is represented by these construction marks?</p> <p>A) Copying $\angle ABC$ B) The perpendicular bisector of \overline{BC}</p> <p>C) The angle bisector of $\angle ABC$ D) A perpendicular line \overline{AC}</p>	 <p>4. _____</p>
<p>5. When doing a construction, which geometric instrument is used to measure length?</p> <p>A) A ruler B) A compass C) A protractor D) A straightedge</p>	<p>5. _____</p>
<p>6. Given the diagram, choose all the descriptions that are true.</p> <p>A) The circle is inscribed in the square.</p> <p>B) The triangle is inscribed in the circle.</p> <p>C) The square is inscribed in the circle.</p> <p>D) The circle circumscribes the triangle.</p>	 <p>6. _____</p>

7. Jeff is constructing the angle bisector of $\angle DBE$. What is the next step? Be very specific as to what he should do next. (2 points)

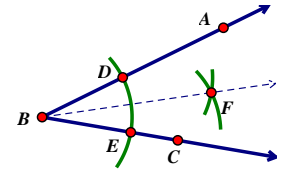
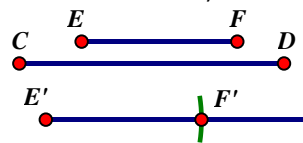
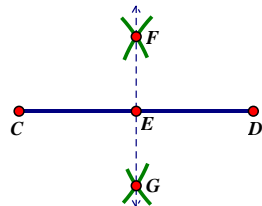
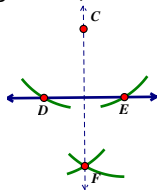


8. When you do a midpoint construction of \overline{CD} , you must stretch your compass so that it is greater than half the distance of \overline{CD} . Why do you have to do this? Why couldn't you use a distance smaller than half of \overline{CD} ? (2 points)

9. A teacher instructs the class to construct four times the length of a segment. George pulls out his ruler and measures the segment to the nearest millimeter and then multiplies the length by four. He marks this distance from one of the endpoints. Has he done this correctly? Explain. (2 points)

10. George is told that \overline{AB} and \overline{CD} have equal lengths. The student writes down $\overline{AB} = \overline{CD}$. What is wrong with this mathematical statement? (2 points)

11. Use the diagram to complete the relationship. (1 point each)
 (In diagrams 1, 2 and 4 the compass was constant for each individual construction.)



a) $DF =$ _____

c) $CE =$ _____

e) _____ = _____

g) $m\angle ABF =$ _____

b) $\overline{EF} \cong$ _____

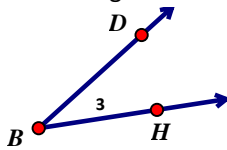
d) $\overline{ED} \cong$ _____

f) _____ \cong _____

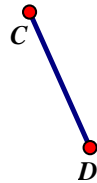
h) $\overline{BE} \cong$ _____

12. Complete the following. (2 points each)

a) Provide all correct names for the angle.



b) Draw the perpendicular bisector of \overline{CD} . (Completely label the diagram)



c) Draw a circle inscribed in a square

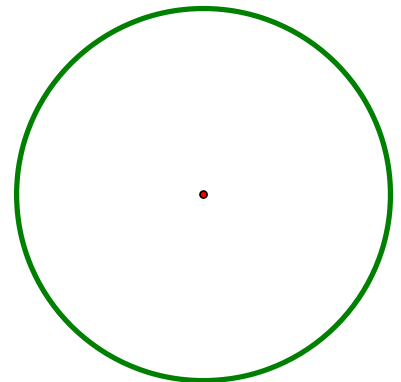
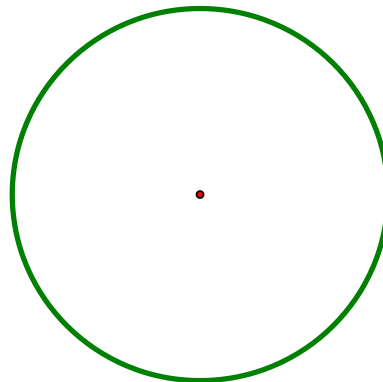
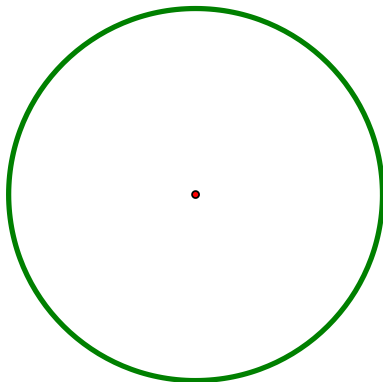
d) Draw a hexagon circumscribed about a circle.

13. Construct the following regular polygons. (2 points each)

a) An Equilateral Triangle

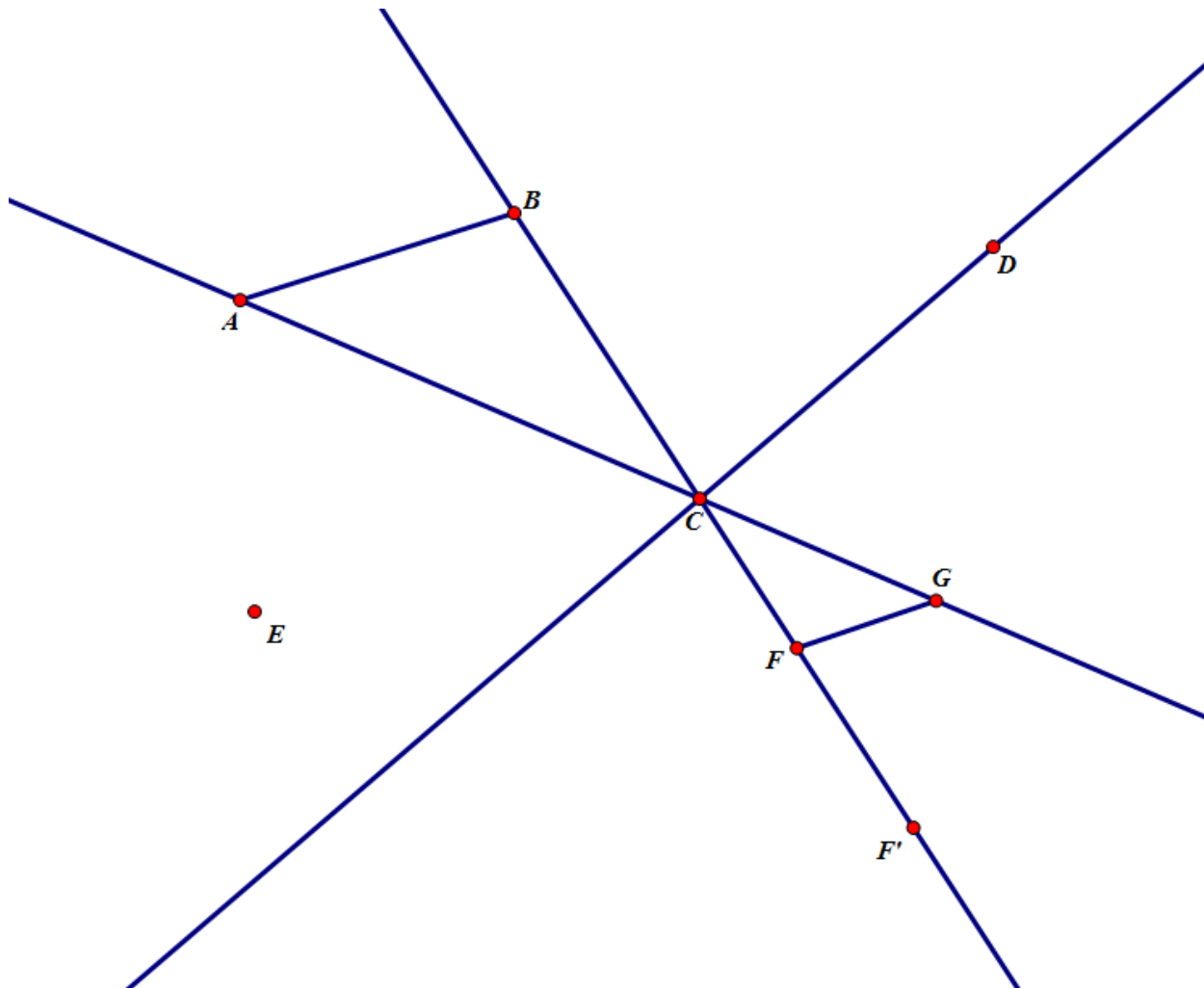
b) A Square

c) A Hexagon



14. Construct the following. (2 points each)

- A) Construct the perpendicular bisector of \overline{AB}
- B) Copy $\angle CFG$ down the ray at F' (thus creating two parallel lines)
- C) Construct the angle bisector of $\angle BCD$
- D) Construct the perpendicular line to \overleftrightarrow{CD} through point E
- E) Construct the perpendicular line to \overleftrightarrow{CD} through point D



- F) On the ray below construct exactly the length $2.5 AB - 2FG$



- G) Who is bigger AB or $CF + FG + GC$? _____ (Compare them on the ray below)



