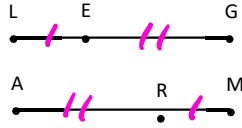


Tools, Proofs & Transversals Quarter 1 Review 1

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 $\overline{LG} \cong \overline{MA}$

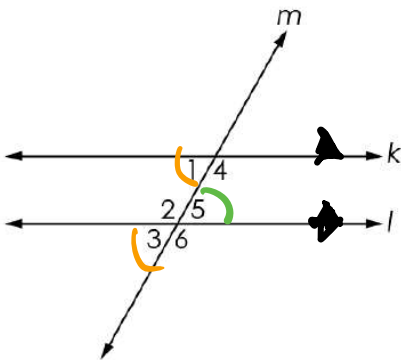


Statement	Reason
a. $\overline{LE} \cong \overline{MR}, \overline{EG} \cong \overline{RA}$	a. Given
b. $LE = MR$ $EG = RA$	b. <u>Def'n of Congruent Segments</u>
c. $LG = LE + EG$ $MA = MR + RA$	c. <u>Segment Add'n Postulate</u>
d. $LG = MR + RA$	d. Substitution Property of Equality (double)
e. $LG = MA$	e. Substitution Property of Equality
f. $\overline{LG} \cong \overline{MA}$	f. <u>Def'n of Congruent Segments</u>

2021 Question 37

A diagram is shown, where $k \parallel l$ and m is a transversal.

Move statements and reasons to the table to prove that $\angle 1 \cong \angle 5$.



Statements	Reasons
1. $k \parallel l$	1. Given
2. $\angle 1 \cong \angle 3$	2. Corresponding angles are congruent.
3. $\angle 3 \cong \angle 5$	3. <u>Vertical angles are congruent</u>
4. $\angle 1 \cong \angle 5$	4. <u>Transitive Property</u>

- $\angle 1 \cong \angle 2$
- $\angle 1 \cong \angle 3$ ✓
- $\angle 1 \cong \angle 4$
- $\angle 2 \cong \angle 3$
- $\angle 2 \cong \angle 4$
- $\angle 2 \cong \angle 5$
- $\angle 2 \cong \angle 6$
- $\angle 3 \cong \angle 4$
- ✓ $\angle 3 \cong \angle 5$
- $\angle 4 \cong \angle 5$
- $\angle 4 \cong \angle 6$

- ✓ Transitive property
- Symmetric property
- Vertical angles are congruent. ✓
- Straight angles form a linear pair.
- Corresponding angles are congruent.
- Alternate exterior angles are congruent.

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 ($\frac{g}{cm^3}$)?

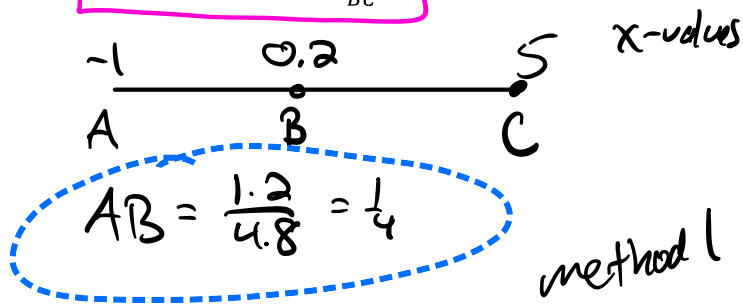
$$\frac{4.45 \text{ kg}}{508} \cdot \frac{1000 \text{ g}}{1 \text{ kg}} = 4450 \frac{g}{cm^3}$$

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 .

Point	Slope	Point-Slope Form
$(-2, 8)$	$m = 4$ $+m = -\frac{1}{4}$	$y - y_1 = m(x - x_1)$ $y - 8 = -\frac{1}{4}(x + 2)$

6. \overline{AC} has endpoints $A(-1, -3)$ and $C(5, 7)$. Point B is on \overline{AC} and is located at $(0.2, 1)$.

What is the ratio of $\frac{AB}{BC}$?



method 2

$$\begin{aligned}
 AB &= \sqrt{[\Delta x]^2 + [\Delta y]^2} & BC &= \sqrt{[\Delta x]^2 + [\Delta y]^2} \\
 &= \sqrt{[-1 - 0.2]^2 + [-3 - 1]^2} & &= \sqrt{[(5) - (0.2)]^2 + [(7) - (1)]^2} \\
 &= \sqrt{[-1.2]^2 + [-4]^2} & &= \sqrt{[4.8]^2 + [6]^2} \\
 &= \sqrt{1.44 + 16} & &= \sqrt{23.04 + 36} \\
 &= \sqrt{17.44} & &= \sqrt{59.04} \\
 AB &\approx 4.18 & BC &= 7.68
 \end{aligned}$$

$$\frac{AB}{BC} \approx \frac{4.18}{7.68} = \frac{1}{2}$$

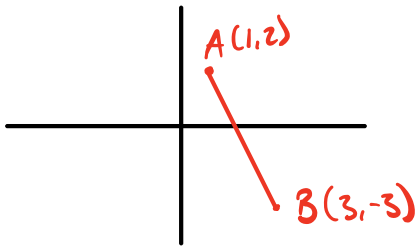
7. A study reports that in 2010 the population of the United States was 308,745,538 people and the land area was approximately 3,531,905 square miles.

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.

$$\frac{308,745,538}{3,531,905} \approx 87.4 \text{ people per square mile}$$

$$\frac{308,745,538 \text{ people}}{3,531,905 \text{ miles}^2} \approx 87.4 \text{ P/mi}^2$$

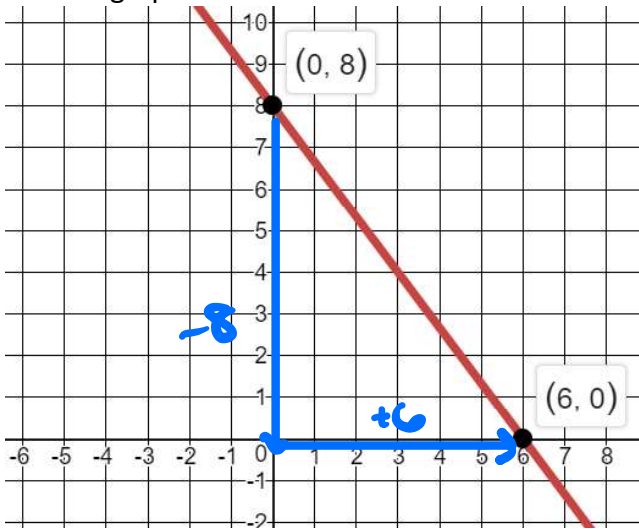
8. Square ABCD has vertices at A(1, 2) and B(3, -3). What is the slope of \overline{BC} ?



$$m_{\overline{AB}} = \frac{\Delta y}{\Delta x} = \frac{2 - (-3)}{1 - 3} = \frac{5}{-2}$$

$$m_{\overline{BC}} = \perp m_{\overline{AB}} = \frac{2}{5}$$

9. The graph of line m is shown

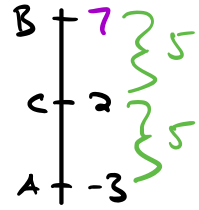
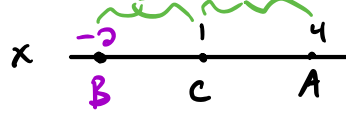


What is the equation of the line that is perpendicular to line m and passes through the point (-2, 4)?

<u>Point</u>	<u>Slope</u>	<u>Point-slope for</u>
(-2, 4)	$m = -4/3$	$y - y_1 = m(x - x_1)$
	$\perp m = \frac{3}{4}$	$y - 4 = \frac{3}{4}(x + 2)$

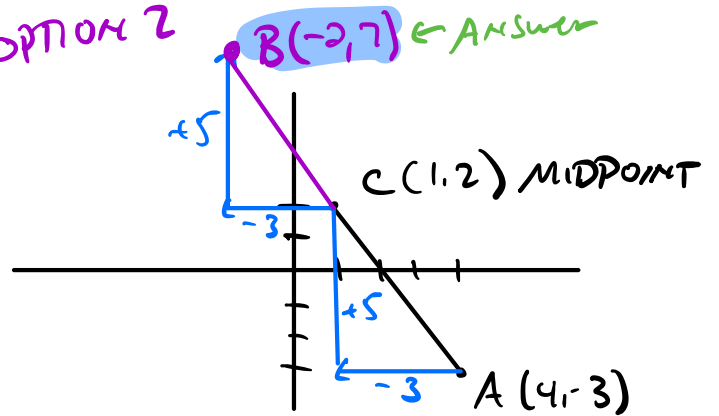
10. Point A is located at (4, -3). The midpoint of line segment AB is point C(1, 2). What are the coordinates of point B?

OPTION 1



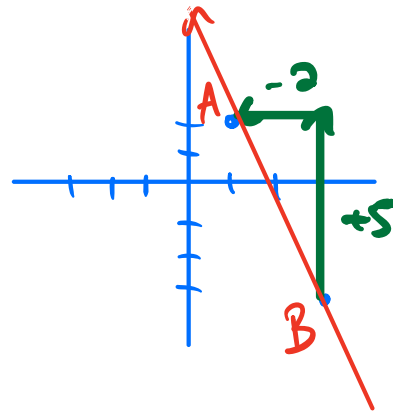
B(-2, 7)

OPTION 2



2018 Question 15

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



$$m_{\overline{AB}} = \frac{5}{-2}$$

$$m_{\overline{BC}} = \perp m_{\overline{AB}} = \frac{2}{5}$$

2017 QUESTION 16

and Coplanar

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?

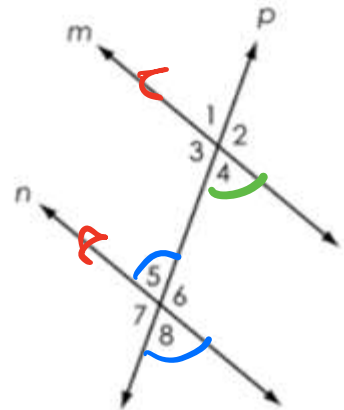
- e. The lines must be straight.
- f. The lines must be coplanar.
- g. The lines can be noncoplanar.
- h. The lines form four right angles.

2018 Question 39

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

Given: $m \parallel n$ and transversal p
 Prove: $\angle 5 \cong \angle 4$

Statements	Reasons
5. $m \parallel n$ and transversal p	Given
6. $\angle 5 \cong \angle 8$	Vertical angle theorem
7. $\angle 8 \cong \angle 4$	Corresponding angles Post
8. $\angle 5 \cong \angle 4$	Transitive Property $\cong \angle$'s



$\angle 8 \cong \angle 1$	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

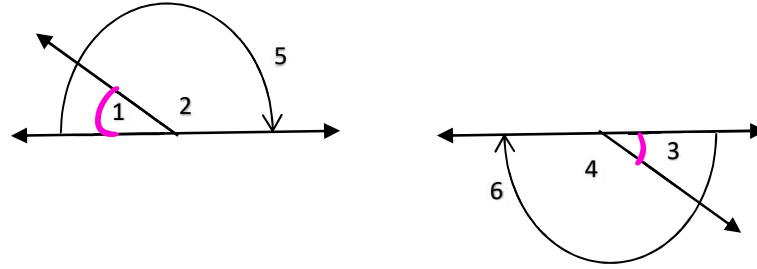
Tools, Proofs & Transversals

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. <u>GIVEN</u>
b. $m\angle 1 = m\angle 3$	b. <u>Def'n of Congruent Angles</u>
c. $\angle 1$ and $\angle 2$ are linear pair $\angle 3$ and $\angle 4$ are linear pair	c. <u>Def'n of linear pair</u>
d. $\angle 1$ and $\angle 2$ are Supplementary $\angle 3$ and $\angle 4$ are Supplementary	d. <u>Supplement Theorem</u>
e. $m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 3 + m\angle 4 = 180^\circ$	e. <u>Def'n of supplementary</u>
f. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	f. <u>Subst PoE</u>
g. $m\angle 3 + m\angle 2 = m\angle 3 + m\angle 4$	g. <u>Subst. PoE</u>
h. $m\angle 2 = m\angle 4$	h. <u>Subtr. PoE</u>
i. $\angle 2 \cong \angle 4$	i. <u>Def'n of Congruent Angles</u>

2. Which term is defined as nonadjacent angles formed by two intersecting lines?
- A. Straight angle
 - B. Vertical angle**
 - C. Corresponding angle
 - D. 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?

- A. She should have said the alternate interior angles are supplementary, instead of congruent.
- B. She should have said the alternate interior angles are complementary, instead of congruent.
- C. She should have said the transversal intersects two parallel lines.**
- D. She should have said the transversal intersects two perpendicular lines.

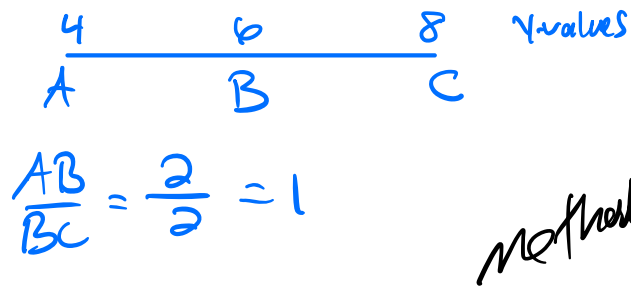
4. Jeremy wants to know the density of a pop tart in grams per cubic centimeter. The pop tart has a mass of 0.00183 kilograms and a volume of 97 cubic centimeters. What is the density of the pop tart, in grams per cubic centimeter ($\frac{g}{cm^3}$)?

$$\frac{0.00183 \text{ kg} \cdot \frac{1000 \text{ g}}{1 \text{ kg}}}{97} = 1.83 \text{ g/cm}^3$$

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 .

<u>Point</u>	<u>Slope</u>	<u>Point-Slope form</u>
$(-4, -5)$	$m = -\frac{3}{2}$	$y - y_1 = m(x - x_1)$
	$\perp m = \frac{3}{2}$	$y + 5 = \frac{3}{2}(x + 4)$

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



OR method 2

$AB = \sqrt{[\Delta x]^2 + [\Delta y]^2}$	$BC = \sqrt{[\Delta x]^2 + [\Delta y]^2}$
$= \sqrt{[3 - 4.5]^2 + [4 - 6]^2}$	$= \sqrt{[6 - 4.5]^2 + [8 - 6]^2}$
$= \sqrt{[-1.5]^2 + [-2]^2}$	$= \sqrt{[1.5]^2 + [2]^2}$
$= \sqrt{2.25 + 4}$	$= \sqrt{2.25 + 4}$
$= \sqrt{6.25}$	$= \sqrt{6.25}$
$AB = 2.5$	$BC = 2.5$

$$\frac{AB}{BC} = \frac{2.5}{2.5} = 1$$

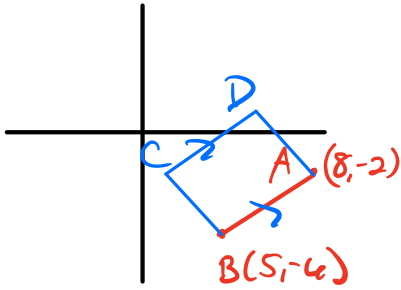
7. A study reports that in 2016 the population of the Gnadon was 1,283 people and the land area was approximately 0.96875 square miles.

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.

$$\frac{1283}{0.96875} \approx 1324.4 \text{ people per square mile}$$

$$\frac{1283 \text{ people}}{0.96875 \text{ mi}^2} \approx 1324.4$$

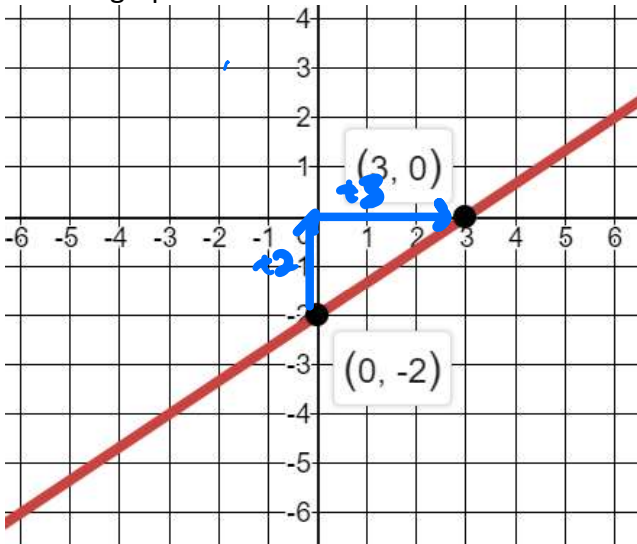
8. Square ABCD has vertices at A(8, -2) and B(5, -6). What is the slope of \overline{CD} ?



$$m_{\overline{AB}} = \frac{\Delta y}{\Delta x} = \frac{-2 - (-6)}{8 - 5} = \frac{4}{3}$$

$$\overline{CD} \parallel \overline{AB} \therefore m_{\overline{CD}} = \frac{4}{3}$$

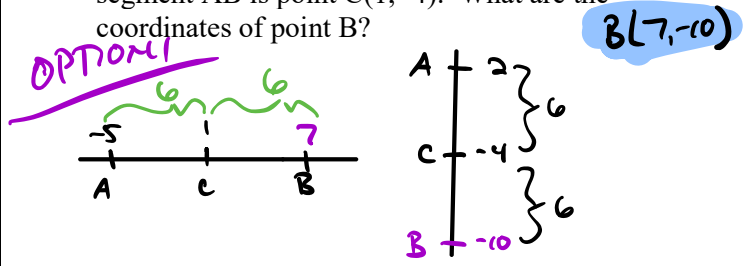
9. The graph of line m is shown



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

<u>Point</u>	<u>Slope</u>	<u>Point-Slope form</u>
(4, -2)	$m = \frac{2}{3}$	$y - y_1 = m(x - x_1)$
	$\perp m = -\frac{3}{2}$	$y + 2 = -\frac{3}{2}(x - 4)$

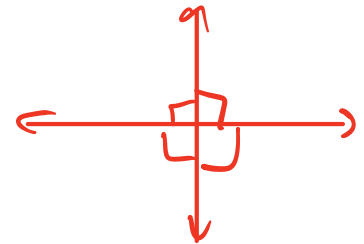
10. Point A is located at (-5, 2). The midpoint of line segment AB is point C(1, -4). What are the coordinates of point B?



2017 Question 31

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

- a. Skew lines
- b. Straight lines
- c. Parallel lines
- d. Perpendicular lines**



2018 Question 9

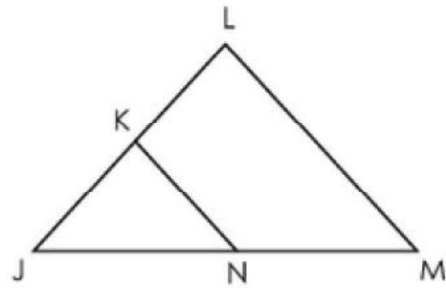
Line k has a slope of -5. Line j is perpendicular to line k and passes through the point (5, 9). Create the equation for line j .

<u>Point</u>	<u>Slope</u>
(5, 9)	$k, m = -5$
	$j, m = \frac{1}{5}$

Point-Slope

$$y - y_1 = m(x - x_1)$$

$$y - 9 = \frac{1}{5}(x - 5) \leftarrow \text{Answer}$$



2021 Question 22

A triangle JLM and line segment KN are given.

A proof of $\frac{JK}{JL} = \frac{JN}{JM}$ is shown.

Statement	Reasons
ΔJLM	Given
?	Given
$\angle JNK \cong \angle JML$ $\angle JKN \cong \angle JLM$	Corresponding angles are congruent <i>we need parallel lines</i>
$\Delta JKN \cong \Delta JLM$	Angle-angle similar triangle postulate
$\frac{JK}{JL} = \frac{JN}{JM}$	Corresponding parts of similar triangles are proportional

Which statement must be added to the given to keep this proof valid?

- A. $\overline{JL} \perp \overline{LM}$
- B. $\overline{KN} \perp \overline{LM}$
- C. $\overline{JL} \parallel \overline{LM}$
- D. $\overline{KN} \parallel \overline{LM}$