2023 Honors Geometry Quarter 1 Exam Homework

Question 2 2017

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 $\frac{AC}{CB}$?

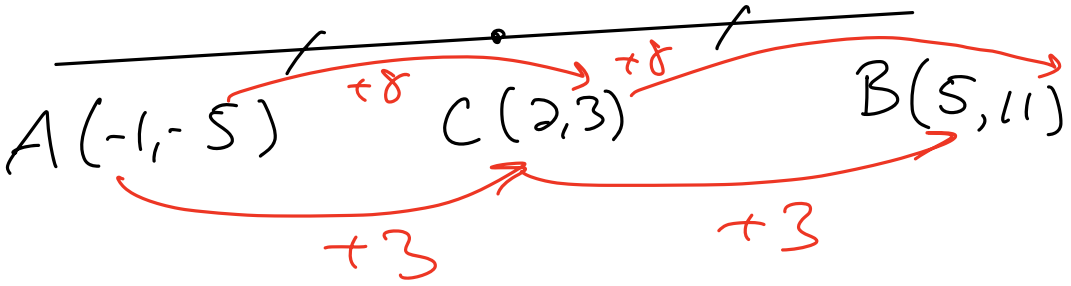
$\frac{AC}{CB} = \frac{AC_x}{CB_x} = \frac{1.5}{4.5}$ or $\frac{AC}{CB} = \frac{AC_y}{CB_y} = \frac{2}{6}$

Question 11 2019

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?

(5 , 11)



Question 7 2017

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.

87.4 *people per square mile*

$$\frac{\text{people}}{mi^2} = \frac{308,745,538}{3,531,905} = 87.4$$

Midvale's Population Density (Mimic 2017 Question 7)

A study reports that in 2021 the population of Port was 665 people and the land area was approximately 0.737 square miles.

Based on the study, what was the population density, in people per square mile, of Midvale in 2021? Round your answer to the nearest tenth.

$$\text{Pop Density} = \frac{\text{People}}{mi^2} = \frac{665}{0.737} = 902.3$$

Tusky's Population Density (Mimic 2017 Question 7)

A study reports that in 2021 the population of Port was 1027 people and the land area was approximately 0.75 square miles.

Based on the study, what was the population density, in people per square mile, of Tusky in 2021? Round your answer to the nearest tenth.

$$\text{Pop Density} = \frac{\text{People}}{mi^2} = \frac{1027}{0.75} = 1,369.3$$

Question 27

2023

A brick has a mass of 2,022.75 grams and a volume of 1,064.5 cubic centimeters.

What is the density of the brick, in grams per cubic centimeter $\left(\frac{g}{cm^3}\right)$? Round your answer to the nearest tenth.

1.9 $\frac{g}{cm^3}$

$$\frac{2022.75}{1064.5} = 1.9$$

Question 11

2018

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.

1080 g

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

2.7 $\frac{g}{cm^3}$

$$\frac{g}{cm^3} = \frac{1080}{400} = 2.7$$

Question 23 2022

Westville has a land area of 84.4 square miles. In 2015, the population density was 22.5 people per square mile.

In 2016, the population was 2,000 people.

By how many people did the population of Westville increase between 2015 and 2016?

2015

Pop Density = $\frac{\text{People}}{\text{mi}^2}$

$22.5 = \frac{\text{People}}{84.4}$

1899 = People

2016

2000

Increase/Decrease = New − OLD

= 2000 − 1899

= 101

Question 16 2017

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.

Question 16 2023

Which statement most accurately defines a ray?

Both Sides

(A) all points of a line that are on either side of a fixed point — Line

(B) all points of a line that are on one side of a fixed point including the fixed point — Ray

(C) all points of a line that are between two fixed points of the line — Kinda Segment

(D) all points of a line that are between two fixed points of the line including the two fixed points — Segment

Question 31 2018

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

Question 9 2018

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.

P	m	PSF
$(5,9)$	k's $= -5$ $\perp m = \frac{1}{5}$	$y - y_1 = m(x - x_1)$ $y - 9 = \frac{1}{5}(x - 5)$

Question 47 2023

What is the slope of a line that is perpendicular to the graph of $y = \frac{5}{4}x - \frac{3}{2}$?

$m = \frac{5}{4}$

$\perp m = -\frac{4}{5}$

(A) $-\frac{4}{5}$

(B) $-\frac{5}{4}$

(C) $\frac{4}{5}$

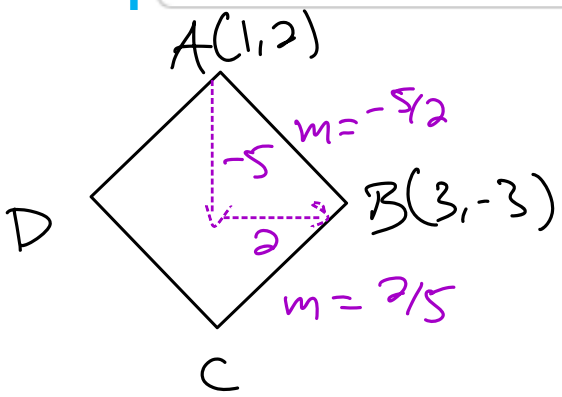
(D) $\frac{5}{4}$

Question 15 2017

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

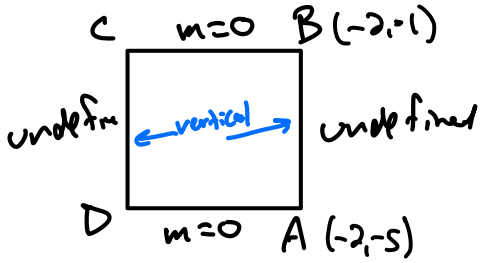
What is the slope of $\overline{BC}$?

2/5



Square Slopes #3 (Mimic 2017 Question 15)

Square ABCD has vertices of $A(-2,-5)$ and $B(-2,-1)$. What is the slope of $\overline{CD}$?



$m_{\overline{AB}} = \frac{\Delta y}{\Delta x}$

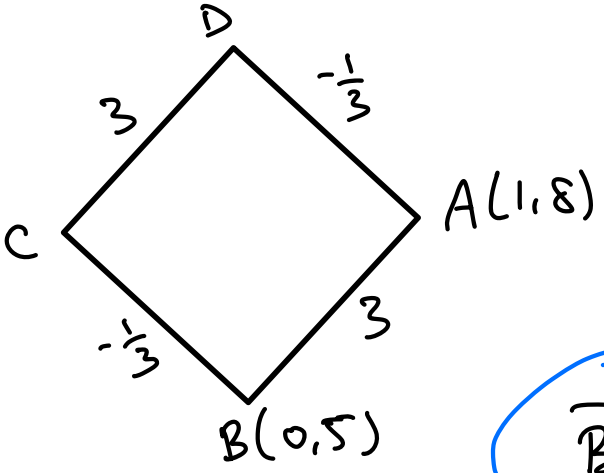
$= \frac{4}{0}$

$m_{\overline{AB}}$ is undefined

$\overline{CD}$ slope is undefined

Square Slopes #4 (Mimic 2017 Question 15)

Square ABCD has vertices of $A(1,8)$ and $B(0,5)$. What is the slope of $\overline{BC}$?



$m_{\overline{AB}} = \frac{\Delta y}{\Delta x}$

$= \frac{3}{1}$

$m_{\overline{AB}} = 3$

$\overline{BC}$ slope is $-\frac{1}{3}$

Question 6

2023

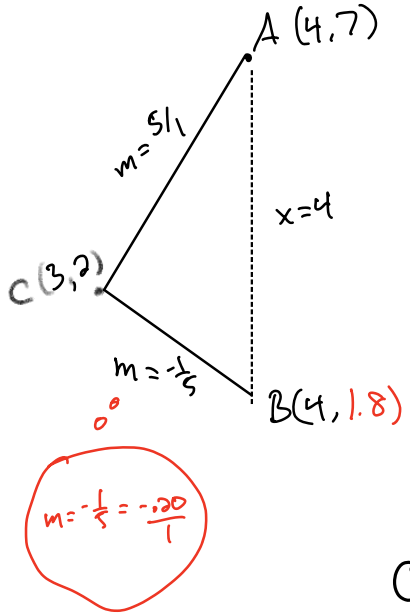
Triangle ABC, with the following characteristics, is placed on the coordinate plane.

- $\overline{AB}$ is on a vertical line.
- $\angle C$ is a right angle.
- Point C is located at (3, 2).
- The slope of $\overline{AC}$ is 5.

What are possible coordinates for points A and B?

A (,)

B (,)

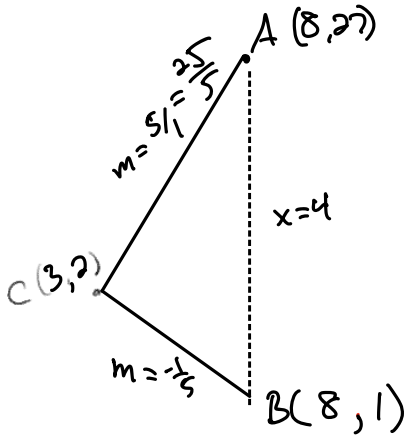


$m = -\frac{1}{5} = -\frac{.20}{1}$

Since A and B are on same vertical line, they have same x-value.

∴ we need to use slope so we go same distance to the right.

OK

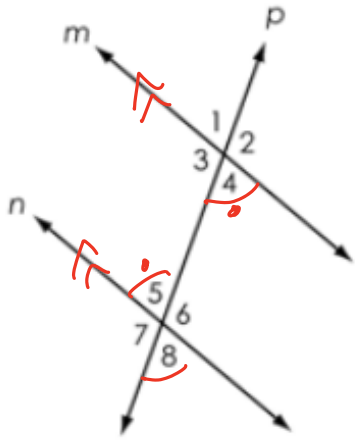


Question 39 2018

Prove Alt INT ∠'s Th'm

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.

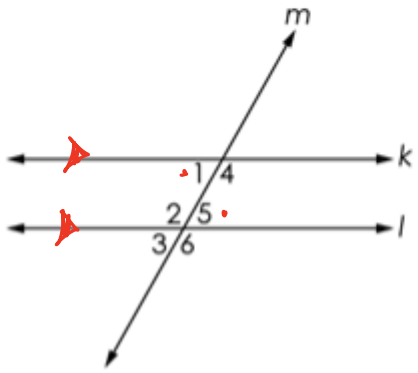
Statements	Reasons
1. $m \parallel n$ and transversal p	1. Given
2. $\angle 5 \cong \angle 8$	2 Vertical angles theorem
3. $\angle 8 \cong \angle 4$	Corresponding angles postulate
4. $\angle 5 \cong \angle 4$	Transitive property

$\angle 8 \cong \angle 1$	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

Question 37

2021 Prove Alt INT ∠'s Th'm

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. ∠1≅∠3	2. Corresponding angles are congruent.
3. ∠3≅∠5	3. Vertical angles are congruent.
4. $\angle 1 \cong \angle 5$	4. Transitive property

$\angle 1 \cong \angle 2$ | $\angle 1 \cong \angle 3$ | $\angle 1 \cong \angle 4$ | $\angle 2 \cong \angle 3$

$\angle 2 \cong \angle 4$ | $\angle 2 \cong \angle 5$ | $\angle 2 \cong \angle 6$ | $\angle 3 \cong \angle 4$

$\angle 3 \cong \angle 5$ | $\angle 4 \cong \angle 5$ | $\angle 4 \cong \angle 6$

Transitive property | Symmetric property

Vertical angles are congruent.

Straight angles form a linear pair.

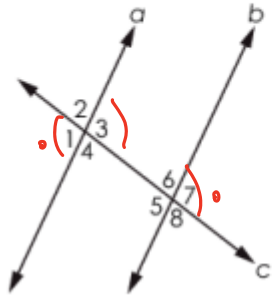
Corresponding angles are congruent.

Alternate exterior angles are congruent.

Question 40

2019

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. $\angle 1 \cong \angle 3$	2. Vertical angles are congruent.
3. $\angle 3 \cong \angle 7$	3. Corresponding angles formed by parallel lines are congruent.
4. $\angle 1 \cong \angle 7$	4. Transitive property

Prove Alt Ext L Thm

$\angle 1 \cong \angle 3$ $\angle 1 \cong \angle 4$ $\angle 1 \cong \angle 5$ $\angle 3 \cong \angle 5$

$\angle 3 \cong \angle 7$ $\angle 4 \cong \angle 6$ $\angle 5 \cong \angle 7$ $\angle 6 \cong \angle 7$

Transitive property

Vertical angles are congruent.

Definition of supplementary angles.

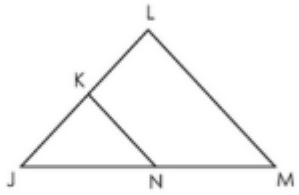
Corresponding angles formed by parallel lines are congruent.

Alternate interior angles formed by parallel lines are congruent.

Alternate exterior angles formed by parallel lines are congruent.

Question 22 2021

A triangle JLM and line segment KN are given.



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

Statements	Reasons
△ JLM	Given
?	Given
∠JNK = ∠JML ∠JKN = ∠JLM	Corresponding angles are congruent.
△ JKN = △ JLM	Angle-angle similar triangle postulate
$\frac{JK}{JL} = \frac{JN}{JM}$	Corresponding parts of similar triangles are proportional.

This requires Parallel lines

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

Ⓐ $\overline{JL} \perp \overline{LM}$

Ⓑ $\overline{KN} \perp \overline{LM}$

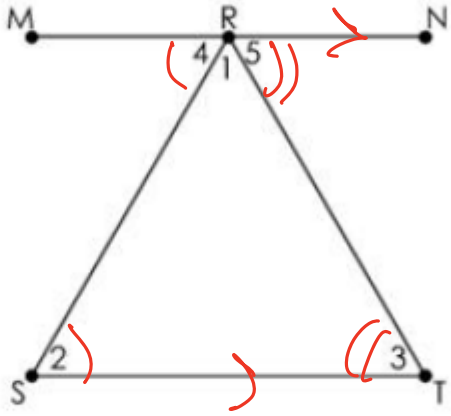
Ⓒ $\overline{JL} \parallel \overline{LM}$

Ⓓ $\overline{KN} \parallel \overline{LM}$

Question 43 2022

Prove Angle Sum Th'm

In the figure shown, $\overline{MN} \parallel \overline{ST}$.



Move statements and reasons into the blank boxes to complete the proof that $m\angle 1 + m\angle 2 + m\angle 3 = 180°$

Statements	Reasons
1. $\overline{MN} \parallel \overline{ST}$	1. Given
2. $m\angle 2 = m\angle 4$ and $m\angle 3 = m\angle 5$	2. Alternate interior angles are congruent.
3. $m\angle 4 + m\angle 1 = m\angle MRT$	3. Angle addition postulate
4. $m\angle MRT + m\angle 2 = 180°$	4.
5. $m\angle 1 + m\angle 4 + m\angle 5 = 180°$	5. Substitution
$m\angle 1 + m\angle 2 + m\angle 3 = 180°$	6. Substitution

AKA Supplement Theorem

$m\angle 1 + m\angle 2 + m\angle 3 = 180°$

$m\angle MRT + m\angle 5 = 180°$

$m\angle MRT + m\angle 2 = 180°$

Linear pair theorem

Definition of complementary angles

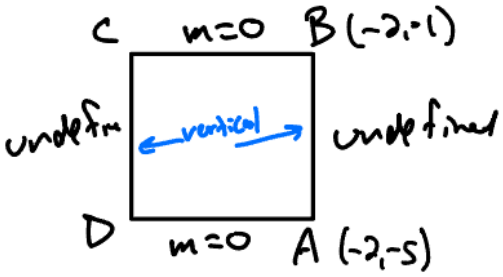
Vertical angles are congruent.

Alternate exterior angles are congruent.

Alternate interior angles are congruent.

Square Slopes #3 (Mimic 2017 Question 15)

Square ABCD has vertices of $A(-2,-5)$ and $B(-2,-1)$. What is the slope of $\overline{CD}$?



$$m_{\overline{AB}} = \frac{\Delta y}{\Delta x}$$

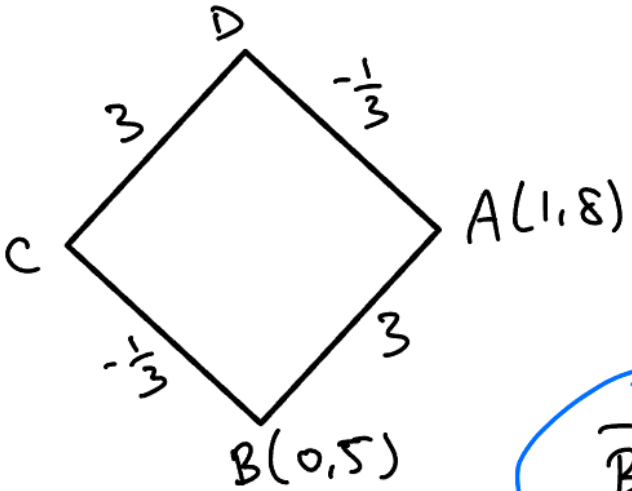
$$= \frac{4}{0}$$

$m_{\overline{AB}}$ is undefined

$\overline{CD}$ slope is undefined

Square Slopes #4 (Mimic 2017 Question 15)

Square ABCD has vertices of $A(1,8)$ and $B(0,5)$. What is the slope of $\overline{BC}$?



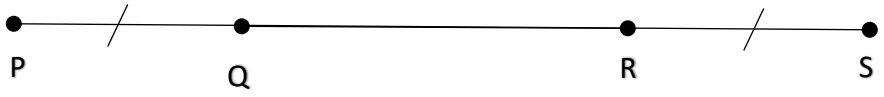
$$m_{\overline{AB}} = \frac{\Delta y}{\Delta x}$$

$$= \frac{3}{1}$$

$$m_{\overline{AB}} = 3$$

$\overline{BC}$ slope is $-\frac{1}{3}$

Problem A
Given $PQ = RS$
Prove: $PR = QS$



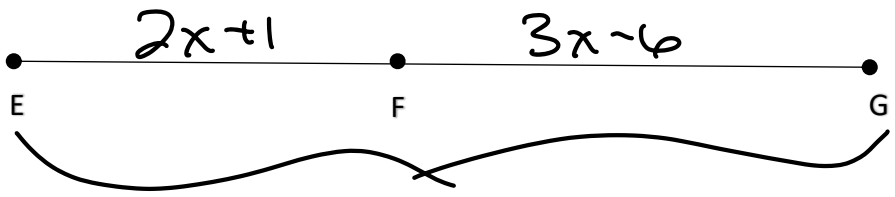
	Statement	Reason
1	$PQ = RS$	Given
2	$PR = PQ + QR$	Segment Add'n Post
3	$QS = QR + RS$	Segment Add'n Post
4	$PR = RS + QR$	Subst PoE
5	$PR = QS$	Subst PoE
6		
7		

Problem B
Given: $2(x + 9) = -6$
Solve: $x = -12$

	Statement	Reason
1	$2(x+9) = -6$	Given
2	$2x + 18 = -6$	Dist PoE
3	$2x = -24$	Subtr. PoE
4	$x = -12$	Div'n PoE
5		
6		
7		

Problem C

If F is between E and G, and $EF = 2x + 1$, $FG = 3x - 6$ and $EG = 35$, solve for x.



35

$EF + FG = EG$

$(2x+1) + (3x-6) = 35$

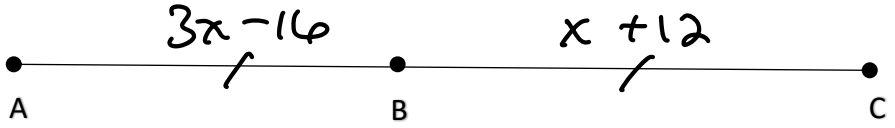
$5x - 5 = 35$

$5x = 40$

$x = 8$

Problem D

If B is the midpoint of $\overline{AC}$, and $AB = 3x - 16$, and $BC = x + 12$ solve for x.



$AB = BC$

$3x - 16 = x + 12$

$2x = 28$

$x = 14$