# 2023 Honors Geometry Quarter 1 Exam Hw 2

## Ratio of two segment lengths #2 (Mimic 2017 Question 2)

$\overline{AB}$ has endpoints $A\ (-2, 0)$ and $B\ (4, 18)$. Point C is on $\overline{AB}$ and is located at $(0, 6)$. Find the ratio of $\frac{AC}{BC}$.

$\Delta x = 4$

$\Delta x = 2$

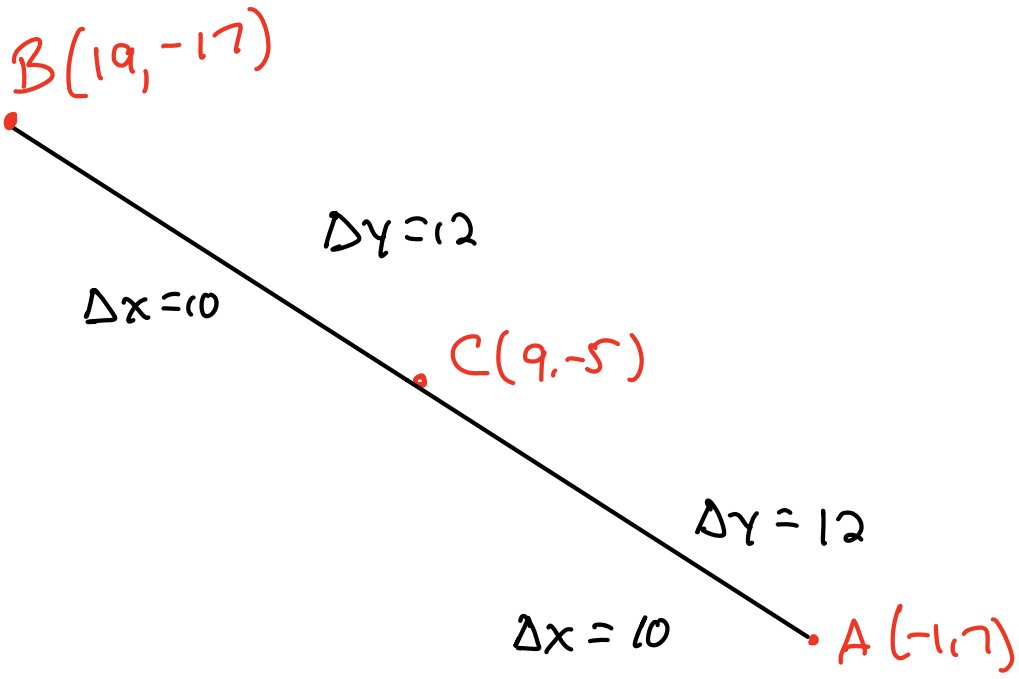
$$\frac{AC_x}{BC_x} = \frac{2}{4}$$

OR

$$\frac{AC_y}{BC_y} = \frac{6}{12}$$

## Find Coordinates of an Endpoint #2 (Mimic 2019 Question 11)

Point A is located at $A\ (-1, 7)$. The midpoint of $\overline{AB}$ is point C$(9, -5)$. What are the coordinates of B?



## Gilmore's Population Density (Mimic 2017 Question 7)

A study reports that in 2021 the population of Gilmore was 18 people and the land area was approximately 0.11 square miles.

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

$$\text{Density} = \frac{\text{People}}{\text{mi}^2} = \frac{18}{.11}$$

## Rock Band (Mimic 2018 Question 11)

A Rock Band wants to know the density of their rock in grams per cubic centimeter. The rock has a mass of 21.28 kilograms and a volume of 315 cubic centimeters.

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

21.28 kg = 21280 g

$$\text{density} = \frac{\text{grams}}{\text{cm}^3} = \frac{21280}{315}$$

## Bed Bugs (Mimic 2022 Question 23)

George's bed has a bed top area of 30 square feet. At midnight, the population density of the bed top was 34 bed bugs per square feet.

By 9 am the next morning, the number of bed bugs had grown to 2005.

By how many bed bugs did the population of George's bed increase between midnight and 9 am due to George, simply a bed sweater, sleeping in bed?

Midnight

$$\text{Density} = \frac{\text{Bugs}}{\text{ft}^2}$$

$$34 = \frac{\text{Bugs}}{30}$$

$$1020 = \text{Bugs}$$

9 Am

2005 bugs

$$2005 - 1020 = 985$$

## 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?

Ⓐ The lines must be straight.

Ⓑ The lines must be coplanar.

Ⓒ The lines can be noncoplanar.

Ⓓ The lines form four right angles.

## Question 16 2023

Which statement most accurately defines a ray?

Ⓐ all points of a line that are on either side of a fixed point

Ⓑ all points of a line that are on one side of a fixed point including the fixed point

Ⓒ all points of a line that are between two fixed points of the line

Ⓓ all points of a line that are between two fixed points of the line including the two fixed points

## Question 31 2018

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

Ⓐ skew lines

Ⓑ straight lines

Ⓒ parallel lines

Ⓓ perpendicular lines

## Create Linear Equation #2 (Mimic 2018 Question 9)

Line $l$ has a slope of $-\frac{1}{2}$. Line $p$ is perpendicular to line $l$ and passes through the point $(3, 4)$. Create the equation for line $p$.

| Point | Slope | P.S.f |
|---|---|---|
| (3, 4) | slope of $l = -\frac{1}{2}$ | $y - y_1 = m(x - x_1)$ |
| | $\perp m$ of $p = 2$ | $y - 4 = 2(x - 3)$ |

## Find perpendicular slope #2 (Mimic 2023 Question 47)

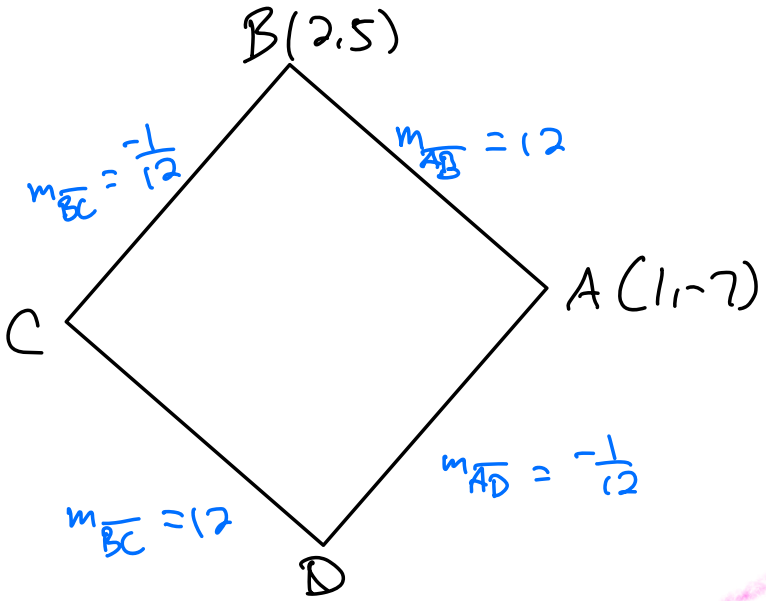
What is the slope of a line that is perpendicular to the graph of $y = \frac{8}{5}x + 2$?

$m = \frac{8}{5}$

$\perp m = -\frac{5}{8}$

## Square Slopes #2 (Mimic 2017 Question 15)

Square ABCD has vertices of $A(1, -7)$ and $B(2, 5)$. What is the slope of $\overline{BC}$?




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

$m_{\overline{AB}} = \frac{12}{1}$

$m_{\overline{AB}} = 12$

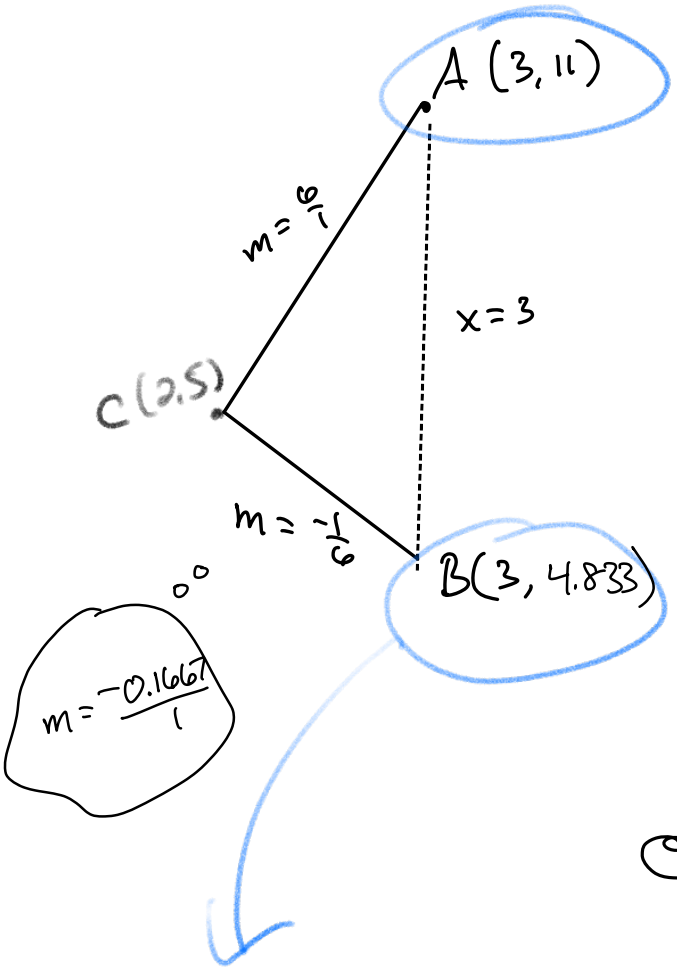
$m_{\overline{BC}} = -\frac{1}{12}$

## Slopes and Right Angles #1 (Mimic 2023 Question 6)

Triangle ABC is on the coordinate plane and has the following characteristics.

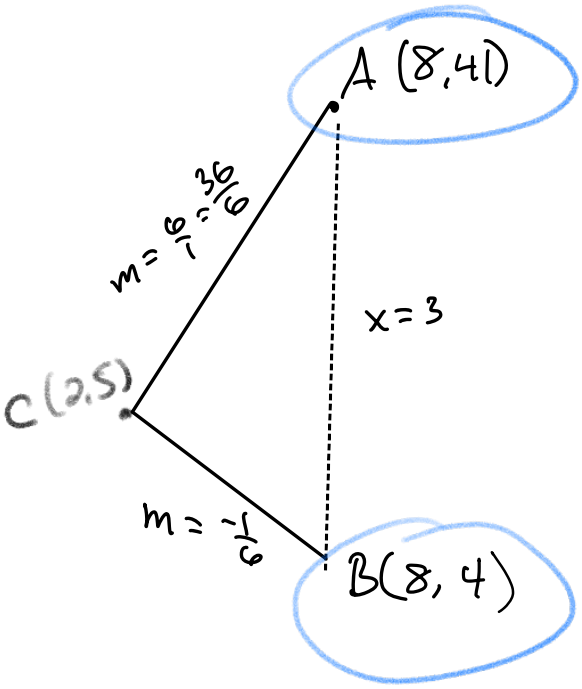
- $\overline{AB}$ is on a vertical line.
- $\angle C$ is a right angle
- Point C is located at $(2, 5)$
- The slope of $\overline{AC}$ is 6.

What are possible coordinates for points A and B?




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.

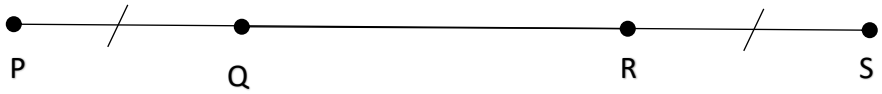
OR




A(3,11)
B(3,4.833)

Quarter 1 Review Hw 2 Name_____

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



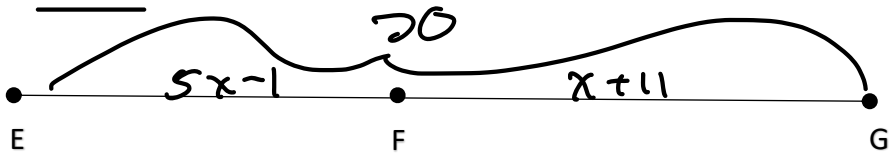

| | Statement | Reason |
|---|---|---|
| 1 | $PQ = RS$ | Given |
| 2 | $PR = PQ + QR$ (p.c) | Seg't Add'n PoST |
| 3 | $QS = QR + RS$ (p.c) | Seg't Add'n PoST |
| 4 (Combo 1+2) | $PR = RS + QR$ | Subst PoE ≅ |
| 5 (Combo 3+4) | $PR = QS$ | Subst PoE ≅ |
| 6 | | |
| 7 | | |

Problem B
Given: $3x - 2 = 16$
Solve: $x = 6$

| | Statement | Reason |
|---|---|---|
| 1 | $3x - 2 = 16$ | Given |
| 2 | $3x = 18$ | Add'n PoE ≅ |
| 3 | $x = 6$ | Div'n PoE ≅ |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |

Problem C

If F is between E and G, and $EF = 5x - 1$, $FG = x + 11$ and $EG = 20$, solve for x.




$EF + FG = EG$

$(5x-1) + (x+11) = 20$

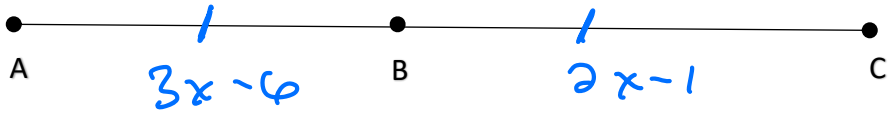
$6x + 10 = 20$

$6x = 10$

$x = \frac{10}{6}$ or $\frac{5}{3}$

Problem D

If B is the midpoint of $\overline{AC}$, and $AB = 3x - 6$, and $BC = 2x - 1$ solve for x.




$AB = BC$

$3x - 6 = 2x - 1$

$x = 5$