

3. Simplify the expression below. Write your answer in scientific notation.

$$\frac{5.8 \times 10^7}{2.9 \times 10^{-9}}$$

Scoring Instructions:

$$2.0 \times 10^{16}$$

6. Write a rational number in fraction form that is equivalent to $-1.\bar{5}$.

Scoring Instructions:

$$-\frac{14}{9}$$

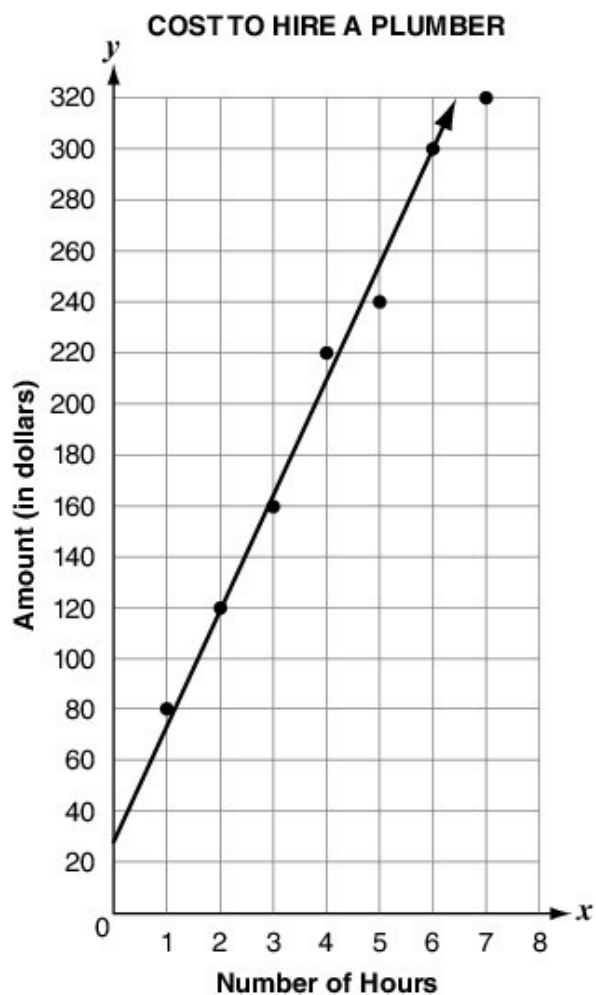
OR equivalent value in fraction form

9. Between what two integers on a number line would $\sqrt{29}$ be plotted?

Scoring Instructions:

Between 5 and 6 or equivalent response

11. The cost to hire a plumber for x hours is shown on the graph.



For this graph, what does the y -intercept of the line of best fit mean in terms of the context?

Scoring Instructions:

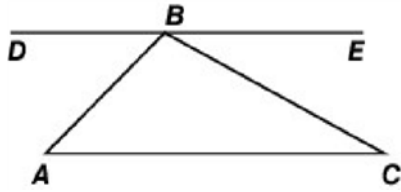
\$30 flat fee

OR

\$30 per visit

OR equivalent explanation

14. In the figure below, \overline{AC} and \overline{DE} are parallel.



Andy lists the steps to show that the sum of angles in a triangle is 180° , as shown below.

Step 1: $m\angle DBA + m\angle ABC + m\angle EBC = 180^\circ$ (sum is a straight angle.)

Step 2: $m\angle DBA = m\angle BAC$

Step 3: $m\angle EBC = m\angle ACB$

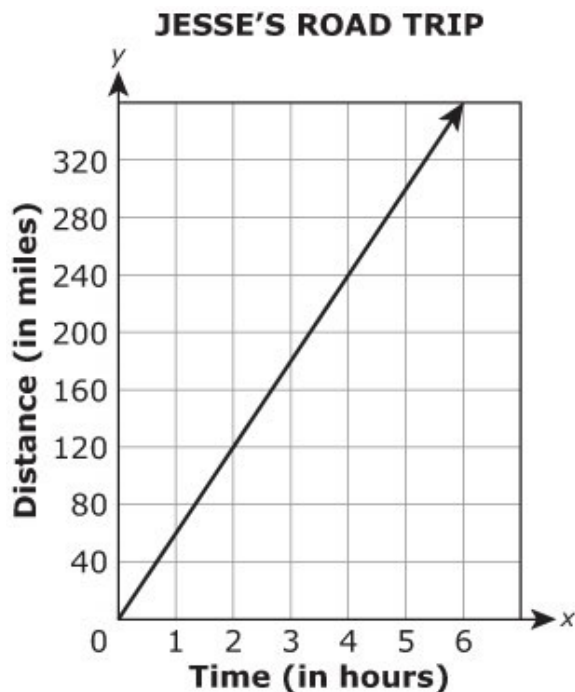
Step 4: $m\angle BAC + m\angle ABC + m\angle ACB = 180^\circ$

What justifies step 2 and step 3?

Scoring Instructions:

Alternate interior angles theorem or equivalent response

17. Jesse and his brother Mark are each taking separate road trips. Jesse represents his speed on a graph, where y represents distance in miles and x represents time in hours.



Mark represents his speed with an equation and defines his variables in the same way that Jesse did.

Mark's equation is $y = 55x$.

Part A. Write Jesse and Mark's speeds in miles per hour.

Part B. Justify your response for each speed.

Scoring Instructions:

Rubric:

- 4 Work demonstrates a **clear and complete** understanding of the mathematical concepts and/or procedures required by the task. Appropriate strategy is shown with clear and complete explanations and interpretations.
- 3 Work demonstrates a **clear** understanding of the mathematical concepts and/or procedures but is not complete. Appropriate strategy is shown, but explanation or interpretation has minor flaws.
OR
Response is incorrect because of calculation errors. Work and strategy indicate a **clear** demonstration of the problem.
- 2 Response demonstrates a **partial** understanding of the mathematical concepts and/or procedures. Appropriate strategy is shown, but explanation or interpretation has minor flaws.
- 1 Response shows **minimal** understanding of the mathematical concepts and/or procedures or provides no explanation or interpretation for the solution or shows major flaws.
- 0 Response is irrelevant, inappropriate, or not provided.

Maximum Points—4

Part A – 2 points

1 point

Jesse's speed is 60 mph

1 point

Mark's speed is 55 mph

Part B – 2 points

1 point

The graph shows that Jesse drove 0 miles in 0 hours and then drove 120 miles in 2 hours. 120 miles divided by 2 hours is 60 miles per hour. Therefore, Jesse drove at a rate of 60 miles per hour.

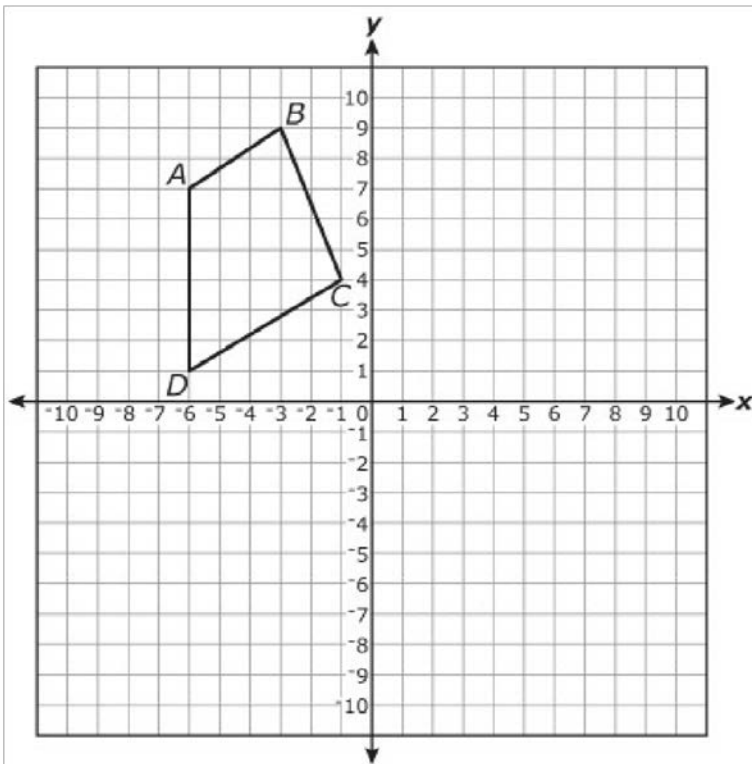
or other appropriate justification

1 point

The equation showing Mark's data is given in slope-intercept form. His speed is 55 miles per hour because the slope is 55.

or other appropriate justification

19. Chad is studying transformations. He starts with quadrilateral $ABCD$.



He reflects $ABCD$ across the y -axis and then rotates the image 90 degrees clockwise around the origin. What is the x -coordinate of Point D after the transformations?

Scoring Instructions:

1

21. The owners of a building plan to hire a company to take care of the lawn maintenance for the building on a weekly basis. The owners get estimates from two different companies. They discover that Best Lawncare Services charges 1.5 times more for materials and equipment rentals than Anytime Landscaping Company does. They also determine that Anytime Landscaping Company charges 1.5 times more per hour for the weekly work than Best Lawncare Services does.

Part A. If Anytime Landscaping Company charges \$300 for materials and equipment rentals and Best Lawncare Services charges \$30 per hour for the weekly work done, for how many hours of work done per week will the charges for the two companies be the same and what will these charges be?

Part B. The building owners estimate that lawn maintenance will require 12 hours of work per week. If both companies do work of equal quality, at the prices provided in part A, which company should the building owners hire? Explain your answer.

Use words and/or numbers to show your work.

Scoring Instructions:

Rubric:

- 2 Work demonstrates a **clear and complete** understanding of the mathematical concepts and/or procedures required by the task. Appropriate strategy is shown with clear and complete explanations and interpretations.
- 1 Response demonstrates a **partial** understanding of the mathematical concepts and/or procedures. Appropriate strategy is shown, but explanation or interpretation has minor flaws.
OR
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- 0 Response is irrelevant, inappropriate, or not provided.

SCORING EXEMPLAR

Maximum Points – 2

Part A – 1 point

- Let x represent the number of hours of work done. Let y represent the total cost of lawn maintenance. Therefore, the system of equation that represents the cost of each company is shown below.

Anytime Landscaping Company: $y = 300 + 45x$

Best Lawncare Services: $y = 450 + 30x$

Substitute $y = 300 + 45x$ in the second equation and solve for x .

$$300 + 45x = 450 + 30x$$

$$15x = 150$$

$$x = 10$$

Now substitute $x = 10$ in the first equation and solve for y .

$$y = 300 + 45(10)$$

$$y = 750$$

After 10 hours of work done on lawn maintenance, the two companies will charge the same amount of \$750.
or equivalent work

Part B – 1 point

- For 12 hours of work, Anytime Landscaping Company charges $300 + 45(12) = \$840$ per week.
For 12 hours of work, Best Lawncare Services charges $450 + 30(12) = \$810$ per week.
- The building owners should hire Best Lawncare Services Company B because they will save \$30 per week on lawn maintenance.

or equivalent work and explanation

23. Amber looks at the following system of equations.

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

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

She concludes that because there is no y-intercept value, the lines cannot intersect.

Is Amber's conclusion correct? Explain your answer and support your reasoning with mathematical examples.

Scoring Instructions:

- 2 Work demonstrates a **clear and complete** understanding of the mathematical concepts and/or procedures required by the task. Appropriate strategy is shown with clear and complete explanations and interpretations.
 - 1 Response demonstrates a **partial** understanding of the mathematical concepts and/or procedures. Appropriate strategy is shown, but explanation or interpretation has minor flaws.
- OR
- Response is incorrect because of calculation errors. Work and strategy indicate a **clear** understanding of the mathematical concepts and/or procedures required by the task.
- 0 Response is irrelevant, inappropriate, or not provided.

Maximum Points – 2

[1 point]

Student responds that Amber's statement is incorrect.

[1 point]

Student explains their response.

Sample response

The slopes of the two lines are different, so there must be a point of intersection.

There is a y-intercept at 0. The solution is (0, 0).

or other appropriate response