SELECTED RESPONSE

1. A figure is dilated by a scale factor of 3. If the origin is the center of dilation, what is the image of a vertex located at (3, 4)?
   A. (1, 1.5)  C. (9, 4)
   B. (3, 12)  D. (9, 12)

2. Triangle ABC is similar to triangle DEF. What is the value of x?

3. Which sequence of translations, reflections, rotations, and/or dilations transforms figure A into figure B?
   A. 180° rotation; reflection across y-axis
   B. dilation with center at origin with scale factor of 2; translation 6 units left
   C. reflection across the y-axis; translation 2 units right
   D. reflection across the x-axis; dilation with center as origin with scale factor of 1/3

4. Which is the image of point A under a dilation centered at the origin described by the rule (x, y) → (4x, 4y)?
   F. (8, 4)  H. (−8, −4)
   G. (1, 1)  J. (1, −1)

5. Which is the image of point B under a dilation centered at the origin with scale factor 1/3?
   A. (1/3, −1/3)  C. (2/3, −2/3)
   B. (−1/3, −1/3)  D. (−1/3, 1/3)

6. What is the measure of angle x?
   F. 57°  H. 23°
   G. 60°  J. 180°

7. What is the value of x?
   A. 30°  C. 97°
   B. 63°  D. 93°

CONSTRUCTED RESPONSE

Use the figure for 8 and 9.

10. Sketch the image of the triangle under a reflection across the x-axis.

11. Sketch the image of the triangle after a rotation 90° counterclockwise about the origin followed by a translation left 1 unit.

12. Sketch the image of the triangle after a reflection across the y-axis followed by a rotation 90° clockwise about the origin.
A. 180° rotation; reflection across y-axis
B. dilation with center at origin with scale factor of 2; translation 6 units left
C. reflection across the y-axis; translation 2 units right
D. reflection across the x-axis; dilation with center as origin with scale factor of 1

7. What is the value of x?
A. 30°
B. 63°
C. 37°
D. 93°

CONSTRUCTED RESPONSE
Use the figure for 8 and 9.

8. Explain how to find the value of x.
The third angle of the triangle on the right measures 180° - (50° + 68°) = 62°.
This angle and the angle marked x° are vertical angles, so x = 62.

9. Explain how to find the value of y.
The triangles are similar by AA, so you can solve the proportion \( \frac{5}{10} = \frac{y}{24} \)
and find that y = 12.

Use the figure for 10 through 13.

10. Sketch the image of the triangle under a reflection across the x-axis.
11. Sketch the image of the triangle after a rotation 90° counterclockwise about the origin followed by a translation left 1 unit.
12. Sketch the image of the triangle after a reflection across the y-axis followed by a reflection across the x-axis.
13. Identify another transformation or sequence of transformations that results in the same image as the result of Problem 12.
   Possible answer: Rotate 180° about the origin.
14. Dilate the figure by a scale factor of 2.5 with the origin as the center of dilation.
   Graph the new figure on the coordinate plane, and list the vertices of the image.
   Show your work.

(0, 4) → (0 × 2.5, 4 × 2.5) → (0, 10)
(2, -4) → (2 × 2.5, -4 × 2.5) → (5, -10)
(-2, -4) → (-2 × 2.5, -4 × 2.5) → (-5, -10)
**UNIT 2 PARCC Assessment Readiness**

**SELECTED RESPONSE**

1. An industrial machine creates $4^3 \cdot 4^4$ products every year. How many products does the machine create each year?
   - A. 4
   - C. 64
   - B. 65,36

2. Simplify the expression:
   - (2)^4 - \left( \frac{7 - 1}{6} \right) + (20 - 17)^3 \times 3^8
   - F. 2^4 - 6^1 + 3^1
   - G. 4^3 - 6^1 + 3^1
   - J. 6^4 - 36^1 + 9^1

3. What is the weight of the ostrich written in scientific notation?
   - A. 0.34392 \times 10^6 pounds
   - B. 3.4392 \times 10^5 pounds
   - C. 3.4392 \times 10^4 pounds
   - D. 34.392 \times 10^3 pounds

4. How many times as great as the weight of the polar bear is the weight of the African bush elephant?
   - F. 0.135 \times 10^3 times as great
   - G. 1.35 \times 10^1 times as great
   - H. 1.35 \times 10^0 times as great
   - J. 5.4 \times 10^2 times as great

5. In 2009, the population of California was estimated as $3.696 \times 10^7$ people. The population of Florida was estimated as $1.854 \times 10^7$ people. What was the total estimated population for these two states?
   - A. 5.550 \times 10^7 people
   - B. 5.550 \times 10^6 people
   - C. 1.842 \times 10^7 people
   - D. 1.842 \times 10^6 people

6. Solve $\frac{1}{2} y + 10 = -25$.
   - F. $y = -70$
   - H. $y = -30$
   - G. $y = -35$
   - J. $y = 70$

7. Your class earned $110.00 Saturday afternoon by washing cars to raise money for a class trip. This is $\frac{3}{4}$ of the money needed for the trip. What is the total amount needed?
   - A. $114.00
   - B. $27.50
   - C. $106.00
   - D. $440.00

8. A sculpture of a giant cube contains 1331 cubes within it. How many smaller cubes are along each edge of the sculpture?
   - F. 11 cubes
   - H. 36 cubes
   - G. 13 cubes
   - J. 133 cubes

   $$3(9 - 8x - 4x) + 8(3x + 4) = 11$$
   - A. $x = 3$
   - B. $x = 4$
   - C. $x = 24$
   - D. $x = 5$

10. Which is approximately equal to $\sqrt{37}$?
    - F. $\frac{31}{2}$
    - G. 1.732050808...
    - H. 3.0
    - J. 9.732050808...

11. Which fraction is equivalent to 0.15?
    - A. $\frac{1}{15}$
    - B. $\frac{10}{15}$
    - C. 15
    - D. 15

12. Find a number greater than 1 and less than 1000 that is both a perfect square and a perfect cube. Give the principal square root and the cube root of your number.
    - Possible answers: 144, 2, 4, 729, 27, 9

13. Explain whether each of the following numbers is rational: $2, \frac{1}{2}, \sqrt{11}$
    - $2$ and $\frac{1}{2}$ are rational because they can be written as ratios of integers: $\sqrt{11}$ is irrational because it is not the square root of a perfect square: 2, 8
    - $\frac{1}{2}$ is rational because it can be written...
1. Which is approximately equal to $\sqrt{3}$?
   - A. $\frac{1}{3}$
   - B. 1.732050808...
   - C. 3.0
   - D. 9.732050808...

10. Which is equivalent to $0.1\bar{5}$?
   - A. $\frac{1}{15}$
   - B. $\frac{10}{99}$
   - C. $\frac{13}{11}$
   - D. $\frac{15}{99}$

12. Solve $3 + 5z = -12$.
   - A. $z = -3$
   - B. $z = -15$
   - C. $z = 1$
   - D. $z = -1.8$

13. Solve $5 = \frac{1}{2} m + 3$.
   - A. $m = 1\frac{1}{2}$
   - B. $m = 4$
   - C. $m = 6$
   - D. $m = 10$

14. Solve $3.7a + 4.4 = -40$.
   - A. $a = -11$
   - B. $a = -13$
   - C. $a = -2$
   - D. $a = -12$

15. What is the value of $m$ for this equation: $3m - 6.8 = 317$?
   - A. 80.6
   - B. 12.6
   - C. 37.8
   - D. 40.8

   $$3(9 - 8x - 4x) + 8(3x + 4) = 11$$
   - A. $x = 3$
   - B. $x = 4$
   - C. $x = 24$
   - D. $x = 5$

16. Find a number greater than 1 and less than 1000 that is both a perfect square and a perfect cube. Give the principal square root and the cube root of your number.
   Possible answers: 64, 16, 729, 27, 9

17. Explain whether each of the following numbers is rational: $2$, $\frac{1}{3}\sqrt{11}$, 0.3.
   a. $2$ is rational because it can be written as the ratio of integers: $\frac{2}{1}$.
   b. $\frac{1}{3}\sqrt{11}$ is not rational because it is not the square root of a perfect square: $0.3$.
   c. 0.3 is rational because it can be written as the fraction $\frac{3}{10}$.

18. Solve the equation $5(x - 2) + 3 = 7x - 9$.
   Show the steps of your solution.
   $$5(x - 2) + 3 = 7x - 9$$
   $$5x - 10 - 3 = 7x - 9$$
   $$5x - 7 = 7x - 9$$
   $$-7 = 2x - 9$$
   $$2 = x$$
   $$x = x$$
### SELECTED RESPONSE

1. An industrial machine creates $4^2 \cdot 4^3$ products every year. How many products does the machine create each year?
   - A. 4
   - B. 16
   - C. 64
   - D. 65,536
   - **Answer:** C. 64

2. Simplify the expression:
   \[(2^3)^4 \cdot (7 - 1)^2 + (20 - 17)^3 \times 3^8\]
   - A. $4^2 \cdot 6^2 + 3^{11}$
   - B. $2^4 \cdot 6^2 + 3^{11}$
   - C. $4^2 \cdot 6^2 + 3^{11}$
   - D. $2^4 \cdot 6^2 + 3^{11}$
   - **Answer:** C. $4^2 \cdot 6^2 + 3^{11}$

3. What is the weight of the ostrich written in scientific notation?
   - A. $0.34392 \times 10^4$ pounds
   - B. $3.4392 \times 10^4$ pounds
   - C. $3.4392 \times 10^5$ pounds
   - D. $34.392 \times 10^4$ pounds
   - **Answer:** B. $3.4392 \times 10^4$ pounds

4. How many times as great as the weight of the polar bear is the weight of the African bush elephant?
   - A. $0.135 \times 10^7$ times as great
   - B. $1.35 \times 10^7$ times as great
   - C. $1.35 \times 10^6$ times as great
   - D. $1.35 \times 10^5$ times as great
   - **Answer:** B. $1.35 \times 10^7$ times as great

5. In 2009, the population of California was estimated as $3.696 \times 10^7$ people.
   The population of Florida was estimated as $1.854 \times 10^7$ people. What was the total estimated population for these two states?
   - A. $5.550 \times 10^7$ people
   - B. $5.550 \times 10^8$ people
   - C. $1.842 \times 10^7$ people
   - D. $1.842 \times 10^8$ people
   - **Answer:** A. $5.550 \times 10^7$ people

6. Solve $\frac{1}{2}y + 10 = -25$.
   - A. $y = -70$
   - B. $y = -30$
   - C. $y = -35$
   - D. $y = -70$
   - **Answer:** C. $y = -35$

7. Your class earned $110.00 Saturday afternoon by washing cars to raise money for a class trip. This is $\frac{1}{4}$ of the money needed for the trip. What is the total amount needed?
   - A. $440.00$
   - B. $275.00$
   - C. $510.00$
   - D. $544.00$
   - **Answer:** A. $440.00$

8. A sculpture of a giant cube contains 1331 cubes within it. How many smaller cubes are along each edge of the sculpture?
   - A. 11 cubes
   - B. 36 cubes
   - C. 13 cubes
   - D. 33 cubes
   - **Answer:** A. 11 cubes

### CONSTRUCTED RESPONSE

   \[3(9 - 8x - 4x) + 8(3x + 4) = 11\]
   - A. $x = 3$
   - B. $x = 4$
   - C. $x = 24$
   - D. $x = 5$
   - **Answer:** B. $x = 4$

10. Which is approximately equal to $\sqrt{3}$?
    - A. $\sqrt{3}$
    - B. $\sqrt[3]{3}$
    - C. $\sqrt[3]{3} = 1.732050808$
    - D. $\sqrt{3} = 3.0$
    - **Answer:** C. $\sqrt[3]{3} = 1.732050808$

11. Which fraction is equivalent to $0.15$?
    - A. $\frac{1}{15}$
    - B. $\frac{15}{95}$
    - C. $\frac{10}{15}$
    - D. $\frac{15}{15}$
    - **Answer:** A. $\frac{1}{15}$

16. Find a number greater than 1 and less than 1000, that is both a perfect square and a perfect cube. Give the principal square root and the cube root of your number.
    - **Possible answer:** 27, 3, 3

17. Explain whether each of the following numbers is rational: $2, \frac{1}{13}, \sqrt{17}, 0.3$.
    - A. $\frac{1}{13}$ is rational because it can be written as a ratio of integers.
    - B. $\sqrt{17}$ is irrational because it is not the square root of a perfect square.
    - C. $0.3$ is rational because it can be written as a ratio of integers.
UNIT 3  PARCC Assessment Readiness

SELECTED RESPONSE

1. Chen is building a birdhouse. The bottom part is a cube with a volume of \( \frac{1}{2} \) cubic foot. What is the length of each edge of the cube in feet?
   A. \( \frac{3}{2} \) foot  C. \( \frac{1}{64} \) foot
   B. \( \frac{3}{4} \) foot  D. \( \frac{1}{12} \) foot

2. Find the volume of the cylinder. Round your answer to the nearest tenth.
   ![](cylinder.png)
   F. 87.9 mm\(^3\)  H. 153.9 mm\(^3\)
   G. 175.8 mm\(^3\)  I. 315.4 mm\(^3\)

3. Find the volume of the figure. Use 3.14 for \( \pi \). If necessary, round your answer to the nearest tenth.
   ![](triangle-cone.png)
   A. 160.1 ft\(^3\)  C. 75.6 ft\(^3\)
   B. 1361.2 ft\(^3\)  D. 4083.6 ft\(^3\)

4. A county has constructed a conical building to store sand. The cone has a height of 185 ft and a diameter of 307 ft. Find the volume of this building to the nearest hundredth.
   ![](cone.png)
   F. 1,531,546.25 ft\(^3\)  H. 31,329.35 ft\(^3\)
   G. 14,427,165.67 ft\(^3\)  I. 8,009,053.23 ft\(^3\)

5. To the nearest tenth, find the volume of a sphere with a diameter of 10 cm. Use 3.14 for \( \pi \).
   A. 314.2 cm\(^3\)  C. 1256.6 cm\(^3\)
   B. 523.3 cm\(^3\)  D. 4188.8 cm\(^3\)

6. Find the volume of a sphere with a radius of 6 cm to the nearest tenth. Use 3.14 for \( \pi \).
   F. 37.7 cm\(^3\)  H. 304.3 cm\(^3\)
   G. 452.2 cm\(^3\)  J. 226.1 cm\(^3\)

7. A cylinder is 5 centimeters tall and has a radius of 2.1 centimeters. Find the volume to the nearest tenth. Use 3.14 for \( \pi \).
   A. 33.0 cm\(^3\)  C. 65.9 cm\(^3\)
   B. 61.2 cm\(^3\)  D. 69.2 cm\(^3\)

8. The diameter of the base of a cylinder is 10 cm and the height is 20 cm. What is the volume of the cylinder? Use 3.14 for \( \pi \).
   F. 628 cm\(^3\)  H. 1,570 cm\(^3\)
   G. 1,256 cm\(^3\)  J. 6,280 cm\(^3\)

9. The table gives the side lengths for four triangles. Which of the triangles is a right triangle?
   ![](triangle-side-lengths.png)
<table>
<thead>
<tr>
<th>Triangle</th>
<th>Length of Sides</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7, 9, 12</td>
</tr>
<tr>
<td>B</td>
<td>12, 13, 14</td>
</tr>
<tr>
<td>C</td>
<td>10, 23, 25</td>
</tr>
<tr>
<td>D</td>
<td>15, 20, 25</td>
</tr>
</tbody>
</table>

A. Triangle A  C. Triangle C
B. Triangle B  D. Triangle D

10. One of the sails of a sailboat is in the shape of a right triangle. What is the height of the sail?
   ![](sail.png)
   F. 16 feet  H. 32 feet
   G. 23.3 feet  J. 64 feet

11. Your soccer club wants to sell frozen pizzas. Each pizza can be cut into 8 slices and each slice is 4 square inches. How many square inches of pizza is available for each slice?

12. Find the volume of the cylinder to the nearest hundredth. Use 3.14 for \( \pi \).
   ![](cylinder-volume.png)
   1,069.58 cubic centimeters

13. A new movie theater is going to sell popcorn. The manager has the choice of three different size containers shown. The manager plans to charge $4.75 for a container of popcorn.
   ![](popcorn-containers.png)
   5 cm
   3 cm
   2 cm

A. 3 cm  B. 5 cm  C. 2 cm

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6. A county has constructed a conical building to store sand. The cone has a height of 195 ft and a diameter of 307 ft. Find the volume of this building to the nearest hundredth.

\[ V = \frac{1}{3} \pi r^2 h \]

- A. Triangle A
- B. Triangle B
- C. Triangle C
- D. Triangle D

10. One of the sails of a sailboat is in the shape of a right triangle. What is the height of the sail?

\[ \text{Height} = \frac{\text{Area}}{\text{Base}} \]

- E. 16 feet
- F. 32 feet
- G. 23.3 feet
- H. 64 feet

**Constructed Response**

11. Your soccer club wants to sell frozen yogurt to raise money for new uniforms. The club has the choice of the two different size containers shown. Each container costs the club the same amount. The club plans to charge customers $2.50. Which container should the club buy? Explain.

Possible answers: Volume: Using \( \pi \)

- Cylinder is \( 157.08 \text{ cm}^3 \)
- Cone is \( 39.26 \text{ cm}^3 \)

The soccer club would make more money using the cone-shaped container because its volume is smaller.

12. Find the volume of the cylinder to the nearest hundredth. Use 3.14 for \( \pi \).

\[ V = \pi r^2 h \]

13. A new movie theater is going to sell popcorn. The manager has the choice of the three different size containers shown. The manager plans to charge $4.75 for a container of popcorn. Which container would you choose as the manager of the movie theater? Explain.

Possible answers: Volume: Using \( \pi \)

- Cylinder is \( 132 \text{ cm}^2 \)
- Cone is \( 445 \text{ cm}^2 \)
- Cube is \( 786 \text{ cm}^2 \)

The cone has the smallest volume, so it would use the least popcorn.
1. Determine if the relation represents a function.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>-1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

A. The relation is a function.
B. The relation is not a function.

2. The data in the table below form a function. What values in the table would change the relation to NOT be a function?

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>-2</td>
<td>7</td>
</tr>
<tr>
<td>-8</td>
<td>10</td>
</tr>
</tbody>
</table>

F. (1, 9)
G. (-3, 7)
H. (9, 4)
I. (6, 5)

3. Choose the equation that is represented by the data in the table.

<table>
<thead>
<tr>
<th>$b$</th>
<th>$c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>5</td>
</tr>
<tr>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

A. $b = c + 4$
B. $c = b - 6$
C. $c = b - 4$
D. $c = b + 6$

4. The graph, table, and equation show the costs of renting a moving truck from three different companies, where $x$ is the number of miles driven and $f(x)$ is the total cost. Which company is cheapest for 50 miles driven?

Company A

[Graph of cost vs. miles driven]

Company B

<table>
<thead>
<tr>
<th>Miles Driven</th>
<th>25</th>
<th>50</th>
<th>75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>$92.50</td>
<td>$110</td>
<td>$137.50</td>
</tr>
</tbody>
</table>

Company C

$f(x) = 0.75x + 80$

F. Company A
G. Company B
H. Company C
J. All three companies are the same price.

5. Mr. Radmanovic and Mrs. Chin both fill up their cars with gasoline at the beginning of the week. The equation compares the number of miles driven, $x$, to the amount of gasoline in the tank, $f(x)$.

Find and compare the $y$-intercepts for the models and interpret their real-world meanings.

Mr. Radmanovic's Car

$f(x) = -\frac{1}{25}x + 13.6$

Mrs. Chin's Car

<table>
<thead>
<tr>
<th>Miles Driven</th>
<th>Gasoline Remaining (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>13</td>
</tr>
</tbody>
</table>

A. The $y$-intercept for Mr. Radmanovic's car is 13.6 gallons, and for Mrs. Chin's car is 13 gallons.

CONSTRUCTED RESPONSE

6. A mayor made a budget presentation to the town council. The presentation included both the graph and the equation shown.

Tell whether the graph and the equation represent the same model or different models. Then explain when a graph might be more helpful than an equation and vice-versa.

$y = -25x + 12000$

Energy Expenses

<table>
<thead>
<tr>
<th>Year</th>
<th>Budget Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>12000</td>
</tr>
<tr>
<td>2005</td>
<td>10000</td>
</tr>
<tr>
<td>2006</td>
<td>8000</td>
</tr>
<tr>
<td>2007</td>
<td>6000</td>
</tr>
<tr>
<td>2008</td>
<td>4000</td>
</tr>
<tr>
<td>2009</td>
<td>2000</td>
</tr>
</tbody>
</table>

A. The $y$-intercept for Mr. Radmanovic's car is 13.6 gallons, and for Mrs. Chin's car is 13 gallons.
5. Mr. Radmanovic and Mrs. Chin both fill up their cars with gasoline at the beginning of the week. The equation compares the number of miles driven, \( x \), to the amount of gasoline in the tank, \( f(x) \).

Find and compare the \( y \)-intercepts for the models and interpret their real-world meanings.

**Mr. Radmanovic’s Car**

\[ f(x) = -\frac{1}{35}x + 13.6 \]

**Mrs. Chin’s Car**

<table>
<thead>
<tr>
<th>Miles Driven</th>
<th>0</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline Remaining (gallons)</td>
<td>13.2</td>
<td>13</td>
</tr>
</tbody>
</table>

A. The \( y \)-intercept for Mr. Radmanovic’s car is 20. The \( y \)-intercept for Mrs. Chin’s car is 13.2.
Mr. Radmanovic’s car has a larger gasoline tank than Mrs. Chin’s car does.

B. The \( y \)-intercept for Mr. Radmanovic’s car is 13.6. The \( y \)-intercept for Mrs. Chin’s car is 13.2.
Mr. Radmanovic’s car has a larger gasoline tank than Mrs. Chin’s car does.

C. The \( y \)-intercept for Mr. Radmanovic’s car is 13.6. The \( y \)-intercept for Mrs. Chin’s car is 13.
Mr. Radmanovic’s car has a larger gasoline tank than Mrs. Chin’s car does.

D. The \( y \)-intercept for Mr. Radmanovic’s car is 20. The \( y \)-intercept for Mrs. Chin’s car is 40. Mrs. Chin’s car gets better gas mileage than Mr. Radmanovic’s car does.

**Constructed Response**

6. A mayor made a budget presentation to the town council. The presentation included both the graph and the equation shown.

Tell whether the graph and the equation represent the same model or different models. Then explain when a graph might be more helpful than an equation and vice-versa.

\[ y = -250x + 12000 \]

**Energy Expenses**

Energy Expenses (in dollars per hour)

\[ y = -250x + 12000 \]

Since the graph and the equation have the same slopes and \( y \)-intercepts, they represent the same model.

The graph makes it easy to see that energy expenses have decreased. The equation is more helpful when you need exact numerical results.
UNIT 5

PARCC Assessment Readiness

Name ____________________________ Class ____________________________ Date __________

SELECTED RESPONSES

1. Determine whether the rates of change are constant or variable.

<table>
<thead>
<tr>
<th>$x$</th>
<th>-5</th>
<th>-3</th>
<th>2</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>13</td>
<td>5</td>
<td>-15</td>
<td>-23</td>
</tr>
</tbody>
</table>

A. variable  B. constant

2. Find the slope of the line.

\[
\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1}
\]

F. $\frac{1}{2}$  H. $\frac{2}{3}$
G. $\frac{2}{5}$  J. $-\frac{3}{2}$

3. Write the equation of the line that passes through (7, 4) and (4, 8) in slope-intercept form.

A. $y = -\frac{4}{3}x + \frac{3}{4}$  C. $y = -\frac{3}{4}x + \frac{40}{3}$
B. $y = -\frac{3}{5}x + \frac{11}{3}$  D. $y = \frac{5}{3}x + \frac{20}{3}$

4. After it is planted, a tree grows at a rate of 0.3 meters per year. After 4 years the tree is 1.7 meters tall. Write the equation in point-slope form that models the situation. Then, predict the height of the tree after 7 years.

F. $y - 4 = 0.3(x - 1.7); 5.59$ meters
G. $y - 0.3 = 1.7(x - 4); 5.4$ meters
H. $y - 1.7 = 0.3(x - 4); 2.6$ meters
J. $y - 1.7 = 4(x - 0.3); 28.5$ meters

5. Write the point-slope form of the equation of the line with slope $\frac{2}{3}$ that passes through the point (2, -9).

A. $y - 9 = \frac{2}{3}(x + 2)$  C. $y + 9 = \frac{2}{3}(x - 2)$
B. $y + 2 = \frac{2}{3}(x - 9)$  D. $x - 2 = \frac{3}{2}(y + 9)$

6. A remote-control airplane descends at a rate of 2 feet per second. After 3 seconds it is 67 feet above the ground. Write the equation in point-slope form that models the situation. Then, find the height of the plane after 8 seconds.

F. $y - 67 = -2(x - 3); 57$ feet
G. $y - 67 = -3(x - 2); 49$ feet
H. $y - 3 = -2(x - 67); 121$ feet
J. $y - 2 = 67(x - 3); 337$ feet

7. Determine whether the data sets show direct variation.

<table>
<thead>
<tr>
<th>Number of Baskets</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>$12</td>
</tr>
<tr>
<td>5</td>
<td>$15</td>
</tr>
<tr>
<td>6</td>
<td>$21</td>
</tr>
<tr>
<td>8</td>
<td>$24</td>
</tr>
</tbody>
</table>

A. yes  B. no

8. At a summer camp there is one counselor for every 5 campers. Determine whether there is a direct variation between the number of campers, $y$, and the number of counselors, $x$. If so, find the equation of direct variation.

F. direct variation; $y = 5x$
G. direct variation; $x = 5y$
H. direct variation; $y = 5x + 5$
J. no direct variation

9. The graph and the table show costs of renting a compact car from two different companies, where $x$ is the number of miles driven and $f(x)$ is the total cost.

Compare the slopes and interpret their real-world meanings.

**Driven to Succeed Rentals**

![Graph showing total cost vs miles driven]

**Just Go A Way Rent-a-Car**

<table>
<thead>
<tr>
<th>Miles Driven</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
</tbody>
</table>

10. A subway pass costs $20.00 and $1.50 is deducted from the balance on the pass every time you use it. Write the equation to represent this situation, and graph it.

\[ y = -1.50x + 20 \]

11. The altitude on a ski trail drops 2 feet for every 5 feet of horizontal distance traveled. The altitude at the start of the trail is 1000 feet. Write the equation of the trail and sketch it.

\[ y = -\frac{2}{5}x + 1000 \]

12. The altitude on a ski trail drops 2 feet for every 5 feet of horizontal distance traveled. The altitude at the start of the trail is 1000 feet. Write the equation of the trail and sketch it.

\[ y = -\frac{2}{5}x + 1000 \]
3. Write the equation of the line that passes through (7, 4) and (4, 8) in slope-intercept form.
   \[ y = -\frac{1}{3}x + \frac{40}{3} \]

4. After it is planted, a tree grows at a rate of 0.3 meters per year. After 4 years, the tree is 1.7 meters tall. Write the equation in point-slope form that models this situation. Then, predict the height of the tree after 7 years.
   \[ y - 4 = 0.3(x - 1.7) \]
   5.99 meters
   \[ y - 0.3 = 1.7(x - 4) \]
   5.44 meters
   \[ y - 1.7 = 0.3(x - 4) \]
   2.60 meters
   \[ y - 1.7 = 4(x - 0.3) \]
   28.5 meters

5. At a summer camp there is one counselor for every 5 campers. Determine whether there is a direct variation between the number of campers, \( y \), and the number of counselors, \( x \). If so, find the equation of direct variation.
   \[ F. \text{ direct variation: } \frac{y}{x} = 5 \]
   \[ G. \text{ direct variation: } y = 5x \]
   \[ H. \text{ direct variation: } y = 5x + 5 \]
   \[ J. \text{ no direct variation} \]

9. The graph and the table show costs of renting a compact car from two different companies, where \( x \) is the number of miles driven and \( f(x) \) is the total cost.

<table>
<thead>
<tr>
<th>Miles Driven</th>
<th>10</th>
<th>20</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>44.50</td>
<td>49.00</td>
<td>53.50</td>
</tr>
</tbody>
</table>

- The slope for Just Go A Way is 0.45.
- The slope for Driven to Succeed is 1.25.
- Driven to Succeed has a greater per-mile cost than Just Go A Way does.
- The slope for Driven to Succeed is 0.50.
- Driven to Succeed has a greater per-mile cost than Just Go A Way does.
- The slope for Driven to Succeed is 0.85.
- Driven to Succeed has a greater per-mile cost than Just Go A Way does.
- The slope for Driven to Succeed is 0.25.
- Driven to Succeed has a greater per-mile cost than Just Go A Way does.
- The slope for Driven to Succeed is 0.25.
- Driven to Succeed has a greater per-mile cost than Just Go A Way does.

11. A subway pass costs $20.00 and $1.50 is deducted from the balance on the pass every time you use it. Write the equation to represent this situation, and graph it.
   \[ y = -1.50x + 20 \]

12. The altitude on a ski trail drops 2 feet for every 5 feet of horizontal distance traveled. The end of the trail has an altitude of 1,000 feet and is a horizontal distance of 2000 feet from the start.
   a. Write an equation in point-slope form that represents this situation, and graph the equation.
   \[ y - y_1 = m(x - x_1) \]
   \[ y - 1000 = \frac{-2}{5}(x - 2000) \]

   b. Use the graph to find the altitude at the start of the trail.
   The altitude at the start of the trail is 400 feet.
UNIT 6: PARCC Assessment Readiness

Name: ____________________________ Class: ____________________________ Date: ____________________________

SELECTED RESPONSE

1. Gloria drives her daughter to school in the morning and then comes back home. She stays home until she has to go to pick up her daughter from school, and then they both return home again. Which graph best shows the situation?

A. ____________________________ B. ____________________________ C. ____________________________ D. ____________________________

2. Which situation is best represented by the graph?

__________________________________________________

3. Rebecca played several games of cards with her brother. She made a scatter plot showing how many minutes each game lasted and how many points she scored during that game. Use the scatter plot for 3–5.

4. Using the trend line, how many points can Rebecca expect to score if the game lasts 25 minutes?

A. 25 B. 45 C. 70 D. 100

5. What is the equation for the trend line?

F. $y = 2x$ G. $y = 3x$ H. $y = 3x - 5$ J. $y = 3x + 5$

6. Using the equation for the trend line, how many points might Rebecca score in a game that lasts 100 minutes?

A. 95 B. 200 C. 205 D. 295

6. Use the table to make a graph and to write an equation.

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

F. $y = \frac{3}{2}$

G. $y = 3x$

<table>
<thead>
<tr>
<th>Week</th>
<th>High Temp (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>78</td>
</tr>
<tr>
<td>25</td>
<td>55</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>17</td>
<td>65</td>
</tr>
<tr>
<td>13</td>
<td>75</td>
</tr>
<tr>
<td>5</td>
<td>90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week</th>
<th>High Temp (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>78</td>
</tr>
<tr>
<td>7</td>
<td>95</td>
</tr>
<tr>
<td>10</td>
<td>84</td>
</tr>
<tr>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>15</td>
<td>74</td>
</tr>
<tr>
<td>21</td>
<td>62</td>
</tr>
</tbody>
</table>

CONSTRUCTED RESPONSE

Noah researched the weekly high temperature in his city. He chose several weeks between July and December to put in a table. (The first week of July was numbered Week 1 in Noah's source material.) Use this data for Questions 7–10.
6. Use the table to make a graph and to write an equation.

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

F. $y = \frac{3}{2}$

G. $y = 3x$

H. $y = x + 2$

J. $y = 2x + 1$

7. Use Noah's data to make a scatter plot.

8. What type of association is shown on the scatterplot? Explain.
   - **Negative linear association; as weeks increase, temperature decreases.**

9. Draw a trend line on the scatter plot.

10. Remember that Week 1 represents the first week of July so Week 25 represents a week in December. Would your trend line lend to good predictions of high temperatures in May of the next year? Explain.
   - **No; temperatures will not continue to decrease as time passes into the next year.**
UNIT 7 B. PARCC Assessment Readiness

SELECTED RESPONSES

1. A hockey season ticket holder pays $72.48 for her tickets plus $6.00 for a program each game. A second person pays $18.00 for a ticket to every game, but doesn't buy programs. In how many games will they have paid the same amount?
   A. 5
   B. 4
   C. 13
   D. 6

2. Which of the following equations has infinitely many solutions?
   F. \( b + 2 = b + 2 \)
   G. \( b = -b + 2 \)
   H. \( b + 2 = b - 2 \)
   J. \( b + b = 2 \)

3. Which of the following equations has only one solution?
   A. \( c + 2 = c + 2 \)
   B. \( c - c = 2 \)
   C. \( c + 2 = -2 \)
   D. \( c - c = 2 \)

4. Which equation can you use to solve the system of equations shown?
   \[
   \begin{align*}
   -4x + y & = 3 \\
   11x - 5y & = 16
   \end{align*}
   \]
   F. \( 11(4x + 3) - 5y = 16 \)
   G. \( 11x - 5(4x + 3) = 16 \)
   H. \( -4(11x - 5y) = 3 \)
   J. \( -4x + 16 - 11x = 3 \)

5. Solve the system of equations.
   \[
   \begin{align*}
   y & = 5x + 4 \\
   y & = 7x + 6
   \end{align*}
   \]
   A. \((-1, 11)\)
   B. \((-1, -1)\)
   C. \((-1, -1)\)
   D. \((-4, -1)\)

6. A bicyclist heads east at 19 km/h. After she has traveled 24.2 kilometers, another bicyclist sets out in the same direction going 30 km/h. About how long will it take the second bicyclist to catch up to the first bicyclist?

F. It will take the second bicyclist 1.2 hours to catch up to the first bicyclist.
H. It will take the second bicyclist 2.2 hours to catch up to the first bicyclist.

G. It will take the second bicyclist 3.7 hours to catch up to the first bicyclist.

J. It will take the second bicyclist 1.7 hours to catch up to the first bicyclist.

Solve the system of equations.
\[
\begin{align*}
3x - 2y + z &= 9 \\
x + y + 4z &= 10 \\
2x + 3y - z &= 53
\end{align*}
\]
A. \((-6, -13, 2, 0.7)\)
B. \((-1, 4, -6, -3.2)\)
C. \((-5, 0, 4)\)
D. \((10, 12, 3)\)

8. Solve the system by graphing.
   \[
   \begin{align*}
y & = 5x + 3 \\
-4x + y & = 8
   \end{align*}
   \]
   F. This system has infinitely many solutions.
   G. \((-\frac{1}{2}, \frac{1}{2})\)
   H. \((-\frac{1}{2}, \frac{1}{2})\)
   J. This system has no solutions.

9. Students from Thornebrooke Elementary are going on a field trip to an amusement park. Those who have annual passes will pay $10. Other students will pay $35. The school collected $1,375 for 50 students.

CONSTRUCTED RESPONSE

11. Dani solves the system of equations shown graphically and finds that the solution is \((2, 3)\). Explain whether Dani is correct.
\[
\begin{align*}
7x - y &= 7 \\
3x - 2y &= 8
\end{align*}
\]
No, \((2, 3)\) is not where the lines intersect. The point \((2, 3)\) is only one solution of \(3x - 2y = 8\).

12. Solve the equation \(5(x - 2) + 3 = 7x - 9\).
4. Which equation can you use to solve the system of equations shown?
\[
\begin{align*}
-4x + y &= 3 \\
11x - 5y &= 16 \\
\end{align*}
\]
F. \(11x^2 + 3 - 5y = 16\)  
G. \(11x - 5(4x + 3) = 16\)  
H. \(-4(11x - 5y) = 1\)  
J. \(-4x + 16 - 11x = 3\)

5. Solve the system of equations:
\[
\begin{align*}
y &= 5x + 3 \\
y &= 7x + 6 \\
\end{align*}
\]
A. \((-1, 11)\)  
B. \((-1, -1)\)  
C. \((-1, -1)\)  
D. \((-4, 1)\)

7. Solve the system of equations:
\[
\begin{align*}
3x - 2y + z &= 9 \\
x - y + 4z &= 10 \\
2x + 3y - z &= 53 \\
\end{align*}
\]
A. \((-6, -13, 2)\)  
B. \((14, 1, -8.6, 3.2)\)  
C. \((5, 0, 4)\)  
D. \((10, 12, 3)\)

8. Solve the system by graphing.
\[
\begin{align*}
y &= 5x + 3 \\
-5x + y &= 8 \\
\end{align*}
\]
F. This system has infinitely many solutions.
G. \(\left(-\frac{1}{2}, \frac{1}{2}\right)\)  
H. \(\left(\frac{1}{2}, \frac{1}{2}\right)\)  
J. This system has no solutions.

9. Students from Thornebrooke Elementary are going on a field trip to an amusement park. Those who have annual passes will pay $10. Other students will pay $35. The school collected $1,375 for 50 students. Which system of linear equations models this situation?
A. \(10x + 35y = 50\)  
B. \(10x + 35y = 1,375\)  
C. \(10x + y = 50\)  
D. \(35x + y = 1,375\)

10. Which ordered pair is a solution of the system shown?
\[
\begin{align*}
-4x + 5y &= 14 \\
7x + 3y &= -1 \\
\end{align*}
\]
F. \((1, 2)\)  
G. \((1, -2)\)  
H. \((-1, 2)\)  
J. \((-1, -2)\)

11. Dani solves the system of equations shown graphically and finds that the solution is \((2, 7)\). Explain whether Dani is correct.
\[
\begin{align*}
7x - y &= 7 \\
3x - 2y &= 8 \\
\end{align*}
\]
No, \((2, 7)\) is not the point of intersection. The point \((2, 7)\) is only a solution of \(7x - y = 7\).

12. Solve the equation \(5(x - 2) + 3 = 7x - 9\).
\[
5(x - 2) + 3 = 7x - 9
\]
\[
\begin{align*}
x - 10 &= 12 \\
x &= -2 \\
\end{align*}
\]

13. Explain in words how you can determine whether the ordered pair \((1, 2)\) is a solution of the system of equations.
\[
\begin{align*}
4x + 2y &= 8 \\
-2x + 5y &= 8 \\
\end{align*}
\]
The ordered pair is a solution of the system if the pair satisfies both equations. To test the solution, substituting the \(x\) and \(y\) values from the ordered pair into the first and second equations. If you find that both equations are true, then the ordered pair is a solution of the system.
Lesson Practice

Choose the correct answer.
Use the graph below for questions 1 and 2.

1. What is the x-intercept of this line?
   - A. (-4, 0)
   - B. (0, -2)
   - C. (4, 0)
   - D. (0, 2)

2. What is the y-intercept of this line?
   - A. (-4, 0)
   - B. (0, -2)
   - C. (4, 0)
   - D. (0, 2)

3. Which of the following graphs represents the equation $y = 2x - 1$?

   - [Graph A]
   - [Graph B]
   - [Graph C]
   - [Graph D]

4. A line passes through the points (4, 3) and has a slope of $\frac{3}{2}$. Which of the following is not an equation for this line?
   - A. $y = \frac{3}{2}x + 1$
   - B. $y = \frac{3}{2}x - 1$
   - C. $y = 3x - 2$
   - D. $y = 2x - 2$

5. What is the slope of the graph whose equation is $4x - 5y = 20$?
   - A. $-\frac{4}{5}$
   - B. $\frac{4}{5}$
   - C. $\frac{5}{4}$
   - D. $\frac{4}{3}$

6. What is the equation of the line graphed below?
   - A. $y = x$
   - B. $y = x + 3$
   - C. $x = 3$
   - D. $y = 0$

7. Which of the following graphs represents the equation $6x + 2y = 8$?
   - [Graph A]
   - [Graph B]
   - [Graph C]
   - [Graph D]