

# Algebra 1

## Post-Course Test

1. Solve  $n + 7 = -12$ .

$n =$

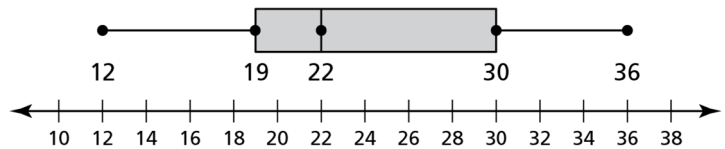
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2. Evaluate  $-\sqrt[3]{-343}$ .

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3. Select all the true statements about the box-and-whisker plot.

- (A) The range of the data is 24.
- (B) The first quartile is 19.
- (C) The median of the data is 22.
- (D) The third quartile is 30.
- (E) The interquartile range of the data is 24.



4. Which expression is equivalent to  $(4x^2 + 5x) + (-7x^2 - 3x)$ ?

- (A)  $11x^2 + 8x$
- (B)  $-3x^2 + 2x$
- (C)  $x^2 - 2x$
- (D)  $3x^2 - 2x$

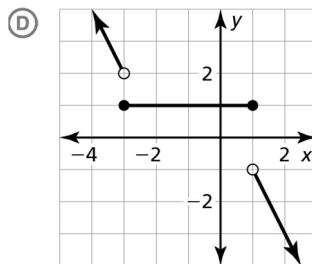
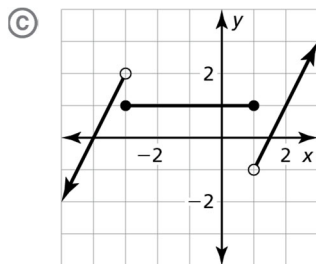
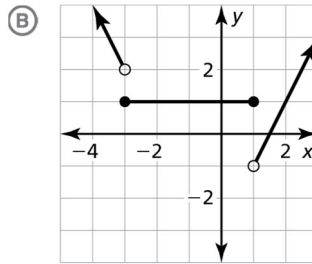
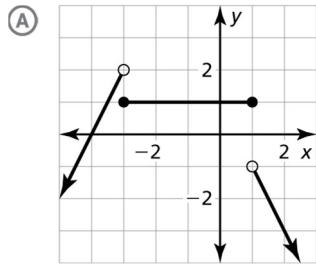
5. Solve the system  $4x + 5y = -6$  and  $4x - 3y = 10$  using any method.

- (A) no solution
- (B)  $(-2, -6)$
- (C)  $(1, -2)$
- (D) infinitely many solutions

**Algebra 1** **Post-Course Test (continued)**

6. Which graph represents the function?

$$f(x) = \begin{cases} 2x + 8, & \text{if } x < -3 \\ 1, & \text{if } -3 \leq x \leq 1 \\ 2x - 3, & \text{if } x > 1 \end{cases}$$



7. Write the sentence as an inequality.

The quotient of  $m$  and 5 is less than 17.

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8. Let  $g(x) = -x^2 + 4$ . What is the value of  $g$  at  $x = -3$  and  $x = 1$ ?

- (A)  $g(-3) = -5, g(1) = 3$
- (B)  $g(-3) = 13, g(1) = 3$
- (C)  $g(-3) = -5, g(1) = 5$
- (D)  $g(-3) = 13, g(1) = 5$

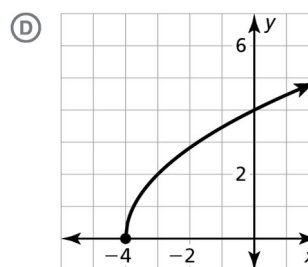
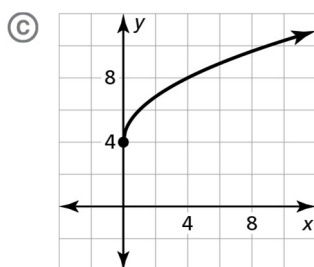
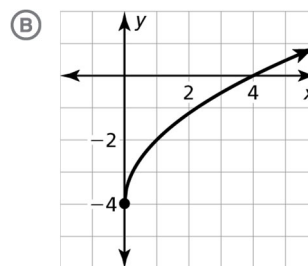
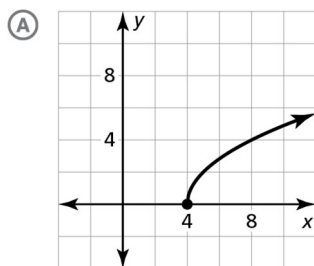
9. Which expression is equivalent to  $(6x + 4)(6x - 4)$ ?

- (A)  $36x^2 + 16$
- (B)  $36x^2 + 48x - 16$
- (C)  $36x^2 - 48x - 16$
- (D)  $36x^2 - 16$

**Algebra****1****Post-Course Test (continued)**

10. Describe the transformations from the graph of  $f(x) = x^2$  to the graph of  $g(x) = -2x^2 - 4$ .
- (A) The graph of  $g$  is a vertical stretch by a factor of 2 and a reflection in the  $x$ -axis, then a vertical translation 4 units down of the graph of  $f$ .
  - (B) The graph of  $g$  is a vertical stretch by a factor of 2 and a reflection in the  $x$ -axis, then a vertical translation 4 units up of the graph of  $f$ .
  - (C) The graph of  $g$  is a vertical stretch by a factor of 2 and a reflection in the  $y$ -axis, then a vertical translation 4 units down of the graph of  $f$ .
  - (D) The graph of  $g$  is a vertical stretch by a factor of 2 and a reflection in the  $y$ -axis, then a vertical translation 4 units up of the graph of  $f$ .

11. Which graph represents the function  $r(x) = 2\sqrt{x+4}$ ?



12. Which of the following are solutions of  $-4x^2 = -36$ ?
- (A)  $x = -9$
  - (B)  $x = -3$
  - (C)  $x = 3$
  - (D)  $x = 9$

**Algebra 1** **Post-Course Test (continued)**

13. Find the slope of the line that passes through (0, 5) and (3, -1.9).

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14. Solve  $4(2b + 3) - 3(3b - 2) = 7$ .

$b =$

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15. Write a quadratic function in standard form that passes through (-2, 0), (4, 0), and (2, -8).

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16. What is the value of the discriminant of  $x^2 + 5x = -6$ ? How many real solutions does the equation have?

- (A) The discriminant is 49 and the equation has two real solutions.
- (B) The discriminant is 1 and the equation has two real solutions.
- (C) The discriminant is 1 and the equation has one real solution.
- (D) The discriminant is 0 and the equation has one real solution.

17. Which of the following data is *not* quantitative?

- (A) daily rainfall in inches
- (B) ages of the people running for president
- (C) gas mileage of new cars
- (D) brands of cars at a dealership

**Algebra  
1****Post-Course Test (continued)**

18. Which expression is equivalent to

$$\frac{9x^3y^4}{3^{-2}x^{-3}y^{-2}}?$$

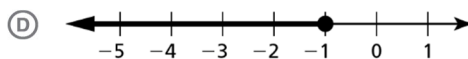
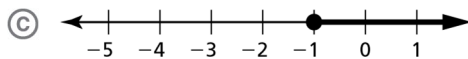
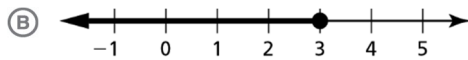
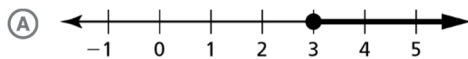
Ⓐ  $\frac{1}{xy^2}$

Ⓑ  $81y^2$

Ⓒ  $\frac{3y^2}{x}$

Ⓓ  $81x^6y^6$

20. Which graph represents the solutions of
- $3 \geq -3(2 - x)$
- ?



22. Which expression is equivalent to
- $b^3 - 3b^2 - 4b + 12$
- ?

Ⓐ  $(b + 2)(b - 2)(b + 3)$

Ⓑ  $(b + 2)(b - 2)(b - 3)$

Ⓒ  $(b - 2)(b - 2)(b - 3)$

Ⓓ  $(b^2 + 4)(b - 3)$

19. Which equation represents the line that passes through
- $(-3, 4)$
- and has a slope of
- $\frac{2}{3}$
- ?

Ⓐ  $y + 4 = \frac{2}{3}(x + 3)$

Ⓑ  $y - 4 = \frac{2}{3}(x - 3)$

Ⓒ  $y + 3 = \frac{2}{3}(x - 4)$

Ⓓ  $y - 4 = \frac{2}{3}(x + 3)$

21. Which system has no solution?

Ⓐ  $x + 6y = 18$   
 $0.5x + 3y = 9$

Ⓑ  $5x + 9y = 0$   
 $7x = 4y$

Ⓒ  $2x - 3y = 12$   
 $\frac{2}{3}x + 4 = y$

Ⓓ  $3x + y = 24$   
 $\frac{1}{3}y = -x + 8$

23. Which function represents a quadratic function whose graph has a range of
- $y \geq 3$
- ?

Ⓐ  $f(x) = x^2 - 6x + 3$

Ⓑ  $f(x) = x^2 - 3$

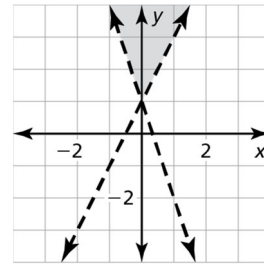
Ⓒ  $f(x) = x^2 + 3$

Ⓓ  $f(x) = x^2 + 6x + 3$

# Algebra 1

## Post-Course Test (continued)

24. Which system of linear inequalities is represented by the graph?



- (A)  $y < 2x + 1$  and  $y > -3x + 1$
- (B)  $y > 2x + 1$  and  $y > -3x + 1$
- (C)  $y > 2x + 1$  and  $y < -3x + 1$
- (D)  $y < 2x + 1$  and  $y < -3x + 1$

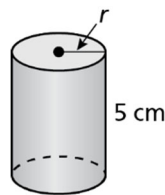
25. Which of the following describes the values of  $c$  for which  $6x + 5 = 2 + 6x + c$  has infinitely many solutions?

- (A)  $c = 5$
- (B)  $c < 5$
- (C)  $c > 3$
- (D)  $c = 3$

26. Which of the following equations does *not* belong with the other three?

- (A)  $y = 2\pi x + 4$
- (B)  $x^2 + 3 = 9 - x - x^2$
- (C)  $y = x(2 - 8)$
- (D)  $\frac{y}{x} = \sqrt{6}$

27. The surface area of the cylinder is 80 square centimeters. What is the radius of the cylinder to the nearest tenth?



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centimeters

28. Which of the following describes the transformations from the graph of  $f(x) = \sqrt[3]{x + 3} - 5$  to the graph of  $g(x) = \sqrt[3]{x - 8} + 7$ ?

- (A) a translation 11 units right and 12 units up
- (B) a translation 11 units left and 12 units up
- (C) a translation 5 units right and 7 units up
- (D) a translation 5 units left and 7 units up

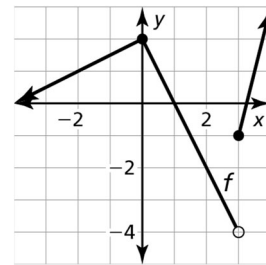
**Algebra 1** Post-Course Test (continued)

29. A photographer wants to buy a new camera to take pictures at a sporting event. The table shows the prices of several cameras. The photographer is willing to pay the mean price with an absolute deviation of at most \$300. How many of the cameras meet this condition?

Camera Prices	
\$1200	\$1400
\$2300	\$1500
\$1800	\$2000

- (A) 5 prices
- (B) 4 prices
- (C) 2 prices
- (D) 1 price

30. The graph of the function  $f$  is shown. Which of the following equal 1?



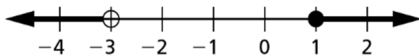
- (A)  $f(-2)$
- (B)  $f(0)$
- (C)  $f\left(\frac{1}{2}\right)$
- (D)  $f(1)$
- (E)  $f\left(\frac{5}{2}\right)$
- (F)  $f(3.5)$

31. You conduct a survey that asks 500 visitors at an amusement park whether they rode the new attraction. Three hundred ninety of the visitors rode the new attraction, 245 of which are teenagers. Eighty adults did not ride the new attraction. What percent of the teenage visitors did not ride the new attraction?

- (A) about 27.3%
- (B) 16%
- (C) about 10.9%
- (D) 6%

# Algebra 1 Post-Course Test (continued)

32. Which compound inequality represents the values of  $x$  that are *not* solutions of the inequality represented by the graph?



- (A)  $x < -3$  or  $x \geq 1$
- (B)  $x \leq -3$  or  $x > 1$
- (C)  $-3 < x \leq 1$
- (D)  $-3 \leq x < 1$

33. Which of the following describes the values of  $c$  for which  $2|3x - 4| - 6 = c$  has no solution?

- (A)  $c < 0$
- (B)  $c < -3$
- (C)  $c < -6$
- (D)  $c \leq 6$

34. Find the inverse of  $f(x) = \sqrt{x + 4} - 3$ .

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35. Solve  $123^{-3x+6} = 1$ .

$x =$

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36. For the system shown, what is the value of  $x + 2y$ ?

$$x + \frac{1}{3}y = 0$$

$$6x - 2y = 6$$

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**Algebra****1****Post-Course Test (continued)**

37. Solve the system  $y = 3x - 12$  and  $y = \sqrt{2x - 1}$ .

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38. The graph of  $g(x) = -3(x - 4) + 5$  is translated 6 units left and 9 units down. What is the value of  $h$  when the equation of the transformed graph is written in vertex form?

- (A)  $-4$
- (B)  $-2$
- (C)  $2$
- (D)  $10$

39. The product of two consecutive odd integers that are positive is 323. What is the greatest number?

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7	7	7	7	7	7	7
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40. The graph of the equation  $ax + by = 36$  has an  $x$ -intercept of 4 and a  $y$ -intercept of  $-3$ . What are the values of  $a$  and  $b$ ?

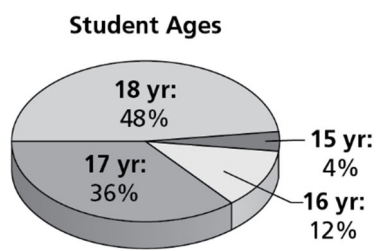
- (A)  $a = 12, b = 9$
- (B)  $a = 9, b = 12$
- (C)  $a = 9, b = -12$
- (D)  $a = -12, b = 9$

# Algebra 1

## Post-Course Test (continued)

41. A train stops at a station every 16 minutes starting at 5:00 A.M. You arrive at the station at 7:18 A.M. How long must you wait for the train?
- (A) 6 minutes
  - (B) 10 minutes
  - (C) 24 minutes
  - (D) 144 minutes

42. The circle graph shows the distribution of the initial ages of 25 students enrolled in a Basic Life Saving certification class. All 25 students take a review course exactly 2 years later to extend their certification. Find the mean, median, and mode of the students' ages.
- (A) mean: 16.5 years; median: 16.5 years; mode: none
  - (B) mean: 17.28 years; median: 17 years; mode: 18 years
  - (C) mean: 18.5 years; median: 18.5 years; mode: none
  - (D) mean: 19.28 years; median: 19 years; mode: 20 years



43. Factor  $3a^2 + 13ab - 10b^2$ .

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44. Solve  $(\sqrt{5})^{2x+4} = (\sqrt[6]{5})^{3x}$ .

$x =$

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45. Select all the expressions that represent a rational number.
- (A)  $\sqrt{169} + 7$
  - (B)  $3 - \sqrt{8}$
  - (C)  $\frac{\sqrt{27}}{\sqrt{3}}$
  - (D)  $\frac{\sqrt{36}}{\sqrt{24}}$
  - (E)  $\frac{3 + \sqrt{11}}{6 + \sqrt{22}}$