

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Simplify using properties of exponents.

$$1) \frac{\left(10x^{\frac{3}{8}}\right)^2}{x^{\frac{1}{8}}}$$

A)  $10x^{\frac{1}{2}}$

B)  $100x^3$

C)  $100x^{\frac{5}{8}}$

D)  $10x^{\frac{5}{8}}$

Find the product.

$$2) (4x - 3)^2$$

A)  $16x^2 + 9$

B)  $4x^2 + 9$

C)  $16x^2 - 24x + 9$

D)  $4x^2 - 24x + 9$

Solve the absolute value inequality. Use interval notation to express the solution set.

$$3) \left| \frac{3y + 6}{2} \right| < 3$$

A)  $(-\infty, -4) \cup (0, \infty)$

B)  $(-4, 0)$

C)  $(-\infty, -4) \cup (4, \infty)$

D)  $(-4, 4)$

Use the given conditions to write an equation for the line.

4) Passing through (2, 2) and parallel to the line whose equation is  $3x + y - 6 = 0$

A)  $y = -3x + 8$

B)  $y = 3x - 8$

C)  $y = -\frac{1}{3}x - \frac{8}{3}$

D)  $y = -3x - 8$

Add .

5)  $\frac{2}{x^2 - 3x + 2} + \frac{6}{x^2 - 1}$

A)  $\frac{24x - 10}{(x - 1)(x + 1)(x - 2)}$

B)  $\frac{8x - 10}{(x - 1)(x + 1)(x - 2)}$

C)  $\frac{10x - 8}{(x - 1)(x + 1)(x - 2)}$

D)  $\frac{8x - 10}{(x - 1)(x - 2)}$

Evaluate the piecewise function at the given value of the independent variable.

6)

$$f(x) = \begin{cases} -4x + 4 & \text{if } x < -1 \\ 2x - 1 & \text{if } x \geq -1 \end{cases}$$

Determine  $f(-5)$ .

A) 24

B) -6

C) 23

D) 20

Simplify the radical expression.

$$7) \frac{\sqrt[3]{16a^5b^9}}{\sqrt[3]{2a^2}}$$

A)  $2ab^3$

B)  $2a^2b^6$

C)  $2ab^3\sqrt[3]{2ab}$

D)  $2ab^6\sqrt[3]{2a}$

Find the domain of the function.

$$8) f(x) = \sqrt{18 - x}$$

A)  $(-\infty, 3\sqrt{2}]$

B)  $(-\infty, 18]$

C)  $(-\infty, 3\sqrt{2}) \cup (3\sqrt{2}, \infty)$

D)  $(-\infty, 18) \cup (18, \infty)$

For the given functions  $f$  and  $g$ , find the composition  $(g \circ f)(x)$ .

$$9) f(x) = \frac{x - 10}{7}, \quad g(x) = 7x + 10$$

A)  $x - \frac{10}{7}$

B)  $7x + 60$

C)  $x$

D)  $x + 20$

Find the distance between the pair of points.

10) (3, -2) and (5, -6)

A) 12

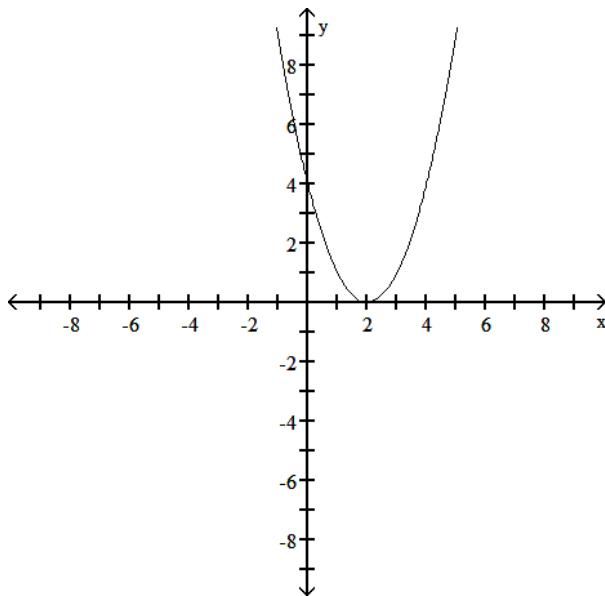
B) 6

C)  $12\sqrt{3}$

D)  $2\sqrt{5}$

The graph of a quadratic function is given. Determine the function's equation.

11)



A)  $j(x) = x^2 + 2$

C)  $f(x) = x^2 - 4x + 4$

B)  $g(x) = x^2 + 4x + 4$

D)  $h(x) = x^2 - 2$

Solve the equation.

$$12) 5x - 6 - 5(x + 1) = -2x - 6$$

$$A) \left\{ \frac{5}{2} \right\}$$

$$B) \left\{ -\frac{7}{2} \right\}$$

$$C) \{1\}$$

$$D) \left\{ -\frac{7}{5} \right\}$$

Solve the equation.

$$13) 3x^2 + x - 6 = 0$$

$$A) \left\{ \frac{1 - \sqrt{73}}{6}, \frac{1 + \sqrt{73}}{6} \right\}$$

$$B) \left\{ \frac{-1 - \sqrt{73}}{2}, \frac{-1 + \sqrt{73}}{2} \right\}$$

$$C) \left\{ \frac{-1 - \sqrt{73}}{6}, \frac{-1 + \sqrt{73}}{6} \right\}$$

$$D) \emptyset$$

Solve the equation.

$$14) (3x + 2)^{1/3} = -4$$

$$A) \left\{ \frac{14}{3} \right\}$$

$$B) \{-22\}$$

$$C) \left\{ -\frac{67}{2} \right\}$$

$$D) \left\{ -\frac{64}{3} \right\}$$

Knowing that 2 is a zero of the polynomial function given below, find the other zeros. Select the answer whose set contains all the zeros.

15)  $f(x) = 3x^3 - 19x^2 + 30x - 8$

A)  $\left\{\frac{1}{3}, 2, 4\right\}$

B)  $\left\{-\frac{4}{3}, 1, 2\right\}$

C)  $\left\{-\frac{1}{3}, 2, -4\right\}$

D)  $\left\{\frac{4}{3}, 1, 2\right\}$

Find the vertical asymptotes, if any, of the graph of the rational function.

16)  $f(x) = \frac{x + 3}{x(x - 3)}$

A)  $x = -3$  and  $x = 3$

B)  $x = 3$

C)  $x = 0$  and  $x = 3$

D) no vertical asymptote

Solve the polynomial inequality. Express the solution set in interval notation.

17)  $x^2 - 5x + 6 \geq 0$

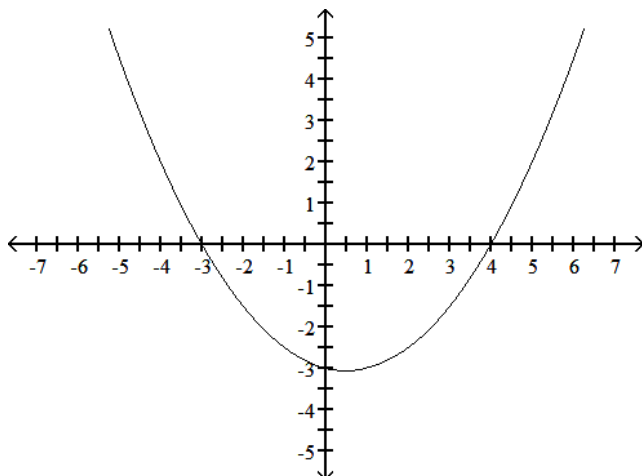
A)  $(-\infty, 2]$

B)  $[3, \infty)$

C)  $(-\infty, 2] \cup [3, \infty)$

D)  $[2, 3]$

18) The graph of  $f(x)$  is given below. For what  $x$ -values is  $f(x) \geq 0$ ?



A)  $(-\infty, -3] \cup [4, \infty)$

B)  $(-3, 4]$

C)  $[-3, \infty)$

D)  $(-\infty, \infty)$

Solve the logarithmic equation.

19)  $\log_3(x + 5) = 2 + \log_3(x + 4)$

A)  $\left\{-\frac{1}{8}\right\}$

B)  $\left\{-\frac{31}{8}\right\}$

C)  $\left\{\frac{1}{8}\right\}$

D)  $\left\{\frac{31}{8}\right\}$

Solve the system. What is the  $x$ -coordinate of the solution?

20)  $-2x + y = 4$   
 $-4x - 5y = 15$

A)  $-3/2$

B)  $-1$

C)  $-5/2$

D)  $-5/14$