

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

Simplify using properties of exponents.

$$1) \frac{\left(\frac{1}{5x^4} \right)^3}{x^{\frac{1}{8}}}$$

A) $25x^{\frac{1}{2}}$

B) $125x^2$

C) $125x^{\frac{5}{8}}$

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

Factor completely.

$$2) 5x^2 - 10x - 240$$

A) $(x + 6)(5x - 40)$

B) $5(x^2 - 2x - 48)$

C) $5(x + 6)(x - 8)$

D) $(5x + 30)(x - 8)$

Find the product.

$$3) (x - 11)^2$$

A) $x^2 + 121$

C) $x^2 - 22x + 121$

B) $121x^2 - 22x + 121$

D) $x^2 - 196$

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

$$4) \left| \frac{8y + 24}{3} \right| < 8$$

A) $(-\infty, -6) \cup (0, \infty)$

B) $(-6, 0)$

C) $(-\infty, -6) \cup (6, \infty)$

D) $(-6, 6)$

Simplify the complex rational expression.

$$5) \frac{\frac{x}{x-2} + 1}{\frac{3}{x^2-4} + 1}$$

A) $\frac{2x+4}{x-1}$

B) $\frac{x+2}{x+1}$

C) $\frac{2x-4}{x-1}$

D) $\frac{2x+4}{x+1}$

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

6)

$$f(x) = \begin{cases} -5x - 3 & \text{if } x < 2 \\ 5x + 1 & \text{if } x \geq 2 \end{cases}$$

Determine $f(-1)$.

A) 2

B) -8

C) 3

D) 5

Simplify the radical expression.

$$7) \frac{\sqrt[3]{135a^5b^9}}{\sqrt[3]{5a^2}}$$

A) $3ab^3$

B) $3a^2b^6$

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

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

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 indicated composition.

$$9) f(x) = 7x + 5, \quad g(x) = 2x - 1$$

$$(f \circ g)(x)$$

A) $14x + 12$

B) $14x + 4$

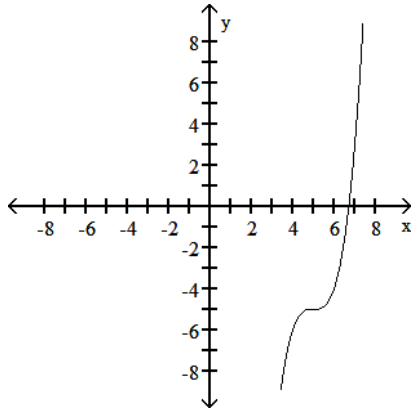
C) $14x - 2$

D) $14x + 9$

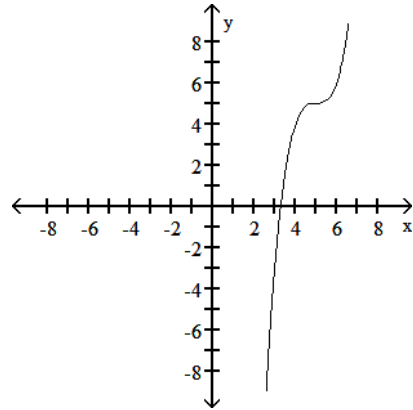
Use transformations of the graph of $f(x) = f(x) = x^3$ to graph the given function.

10) $h(x) = (x + 5)^3 + 5$

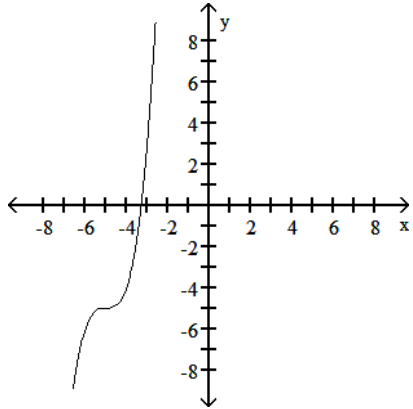
A)



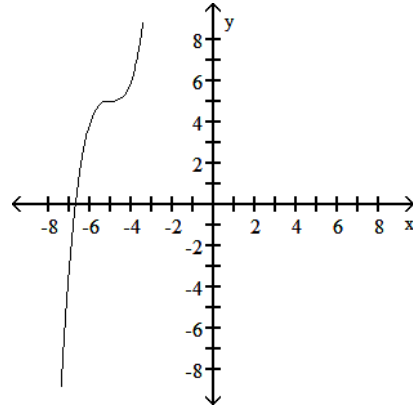
B)



C)



D)



Find the distance between the pair of points.

11) $(3, -2)$ and $(5, -6)$

A) 12

B) 6

C) $12\sqrt{3}$

D) $2\sqrt{5}$

Solve the equation.

$$12) \frac{5}{x} + 6 = \frac{3}{2x} + \frac{15}{4}$$

A) $\left\{\frac{62}{55}\right\}$

B) $\left\{-\frac{9}{14}\right\}$

C) $\left\{-\frac{14}{9}\right\}$

D) $\left\{\frac{55}{62}\right\}$

Solve the equation.

$$13) 20x^3 + 100x^2 + 120x = 0$$

A) $\{0, -3, -2\}$

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

C) $\{0, 3, 2\}$

D) $\{-3, -2\}$

Solve the equation.

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

A) $\left\{\frac{1}{4}\right\}$

B) $\left\{\frac{5}{4}\right\}$

C) $\left\{\frac{4}{3}\right\}$

D) $\{2\}$

If 1 is a zero of the polynomial function, find all the zeros of the function.

15) $f(x) = x^3 + 3x^2 + 9x - 13$

A) $\{-1, -2 + \sqrt{3}, -4 - \sqrt{3}\}$

B) $\{1, -2 + 3i, -2 - 3i\}$

C) $\{1, 3 + \sqrt{3}, 3 - \sqrt{3}\}$

D) $\{1, 3 + 2i, 3 - 2i\}$

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

16) $h(x) = \frac{x - 1}{x(x + 1)}$

A) $x = 1$ and $x = -1$

B) $x = -1$

C) $x = 0$ and $x = -1$

D) no vertical asymptote

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

17) $x^2 + 4x - 5 \geq 0$

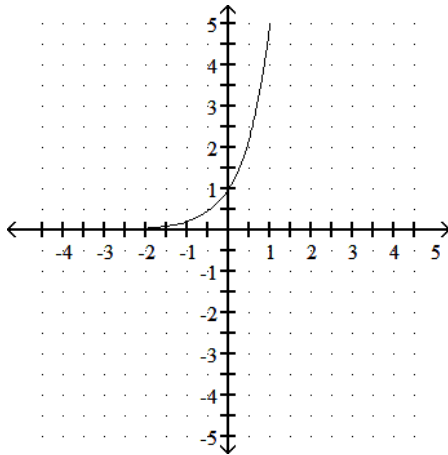
A) $(-\infty, -5]$

B) $[1, \infty)$

C) $(-\infty, -5] \cup [1, \infty)$

D) $[-5, 1]$

The graph of an exponential function is given. Select the function for the graph from the functions listed.



18)

A) $f(x) = (5^x) + 2$

B) $f(x) = (5^x) - 2$

C) $f(x) = 2^x$

D) $f(x) = 5^x$

Solve the logarithmic equation.

19) $\log_5(x + 1) = 3 + \log_5(x - 4)$

A) $\left\{ -\frac{5}{124} \right\}$

B) $\left\{ \frac{501}{124} \right\}$

C) $\left\{ \frac{5}{124} \right\}$

D) $\left\{ -\frac{501}{124} \right\}$

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

20) $6x + y = 5$

$-3x + 4y = -16$

A) 4

B) 1

C) $\frac{4}{3}$

D) $\frac{7}{3}$