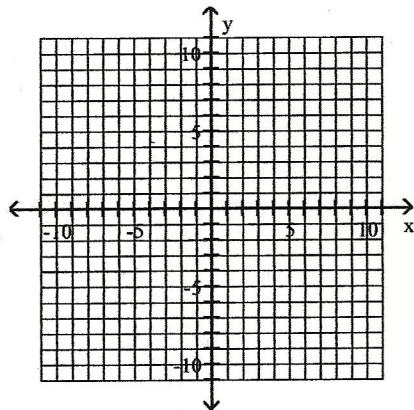


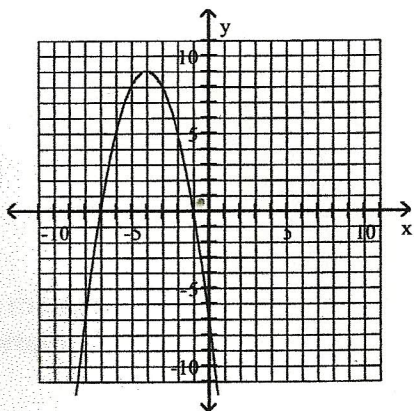
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the axis of symmetry, vertex, and relevant intercept(s) for the quadratic function, then graph.

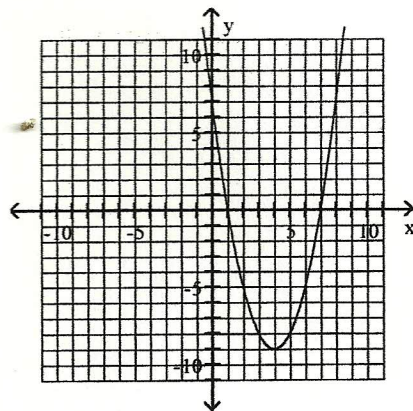
1) $f(x) = -x^2 - 8x - 7$



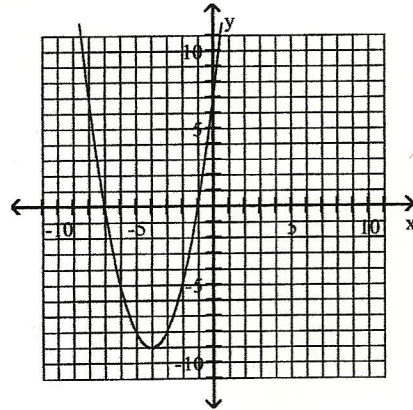
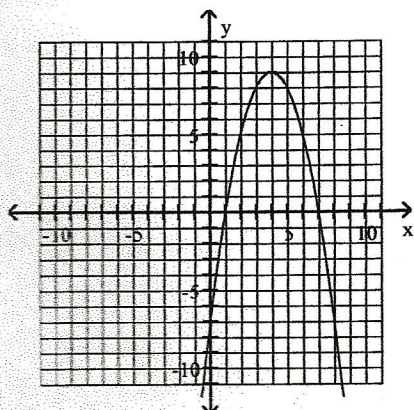
A)



B)



C)



Determine which two functions are inverses of each other.

2) $f(x) = \frac{x-6}{3}$ $g(x) = 3x - 6$ $h(x) = \frac{x+6}{3}$

A) $f(x)$ and $g(x)$

B) $g(x)$ and $h(x)$

C) $f(x)$ and $h(x)$

D) None

Find the inverse of the function.

3) $f(x) = \sqrt{x+8}$

A) $f^{-1}(x) = x - 8$

B) $f^{-1}(x) = \frac{1}{x^2 - 8}$

C) $f^{-1}(x) = x^2 + 8$

D) $f^{-1}(x) = x^2 - 8$

Find the midpoint of the line segment defined by the points.

4) $(-7\sqrt{7}, 3\sqrt{2})$ and $(-2\sqrt{7}, 6\sqrt{2})$

A) $(\frac{-9\sqrt{7}}{2}, \frac{9\sqrt{2}}{2})$

B) $(\frac{5\sqrt{7}}{2}, \frac{3\sqrt{2}}{2})$

C) $(\frac{-5\sqrt{7}}{2}, \frac{-3\sqrt{2}}{2})$

D) $(-9\sqrt{7}, 9\sqrt{2})$

Write the standard form of the equation of the circle with the given center and radius.

5) $(-9, 8); 3$

A) $(x-9)^2 + (y+8)^2 = 9$

B) $(x+8)^2 + (y-9)^2 = 3$

C) $(x-8)^2 + (y+9)^2 = 3$

D) $(x+9)^2 + (y-8)^2 = 9$

Complete the square to write the equation of the circle in standard form.

Then determine the center and radius.

6) $x^2 + y^2 + 14x - 14y = -73$

A) $(x-7)^2 + (y+7)^2 = 25$

$(7, -7), r = 5$

C) $(x+7)^2 + (y-7)^2 = 25$

$(7, -7), r = 25$

B) $(x+7)^2 + (y-7)^2 = 25$

$(-7, 7), r = 5$

D) $(x-7)^2 + (y+7)^2 = 25$

$(-7, 7), r = 25$

Divide and express the result in standard form.

7) $\frac{2i}{1-5i}$

A) $-\frac{5}{13} + \frac{1}{13}i$

B) $\frac{1}{13} - \frac{5}{13}i$

C) $\frac{5}{12} + \frac{1}{12}i$

D) $-\frac{1}{12} + \frac{5}{12}i$

Solve, using the quadratic formula.

8) $x^2 + 6x + 25 = 0$

A) $\{-7, 1\}$

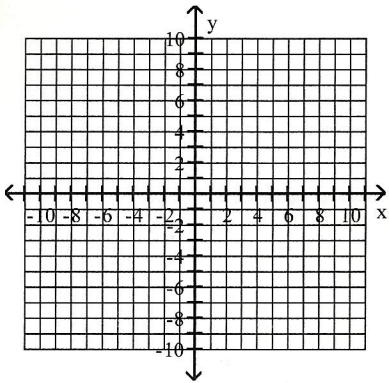
B) $\{-3 \pm 16i\}$

C) $\{-3 + 4i\}$

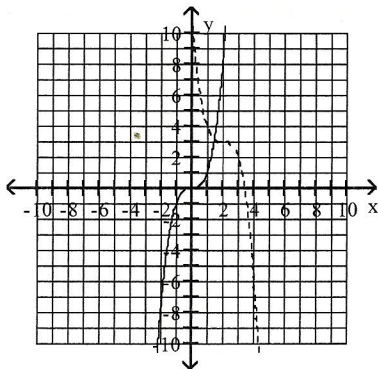
D) $\{-3 \pm 4i\}$

Begin by graphing the standard cubic function $f(x) = x^3$.
Then use transformations of this graph to graph the given function.

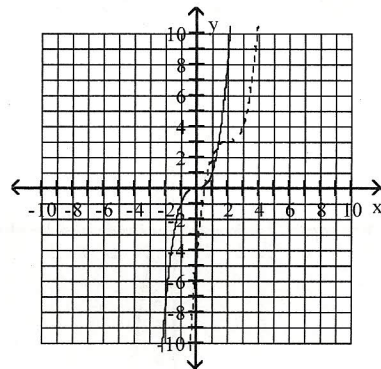
9) $g(x) = -(x - 2)^3 + 3$



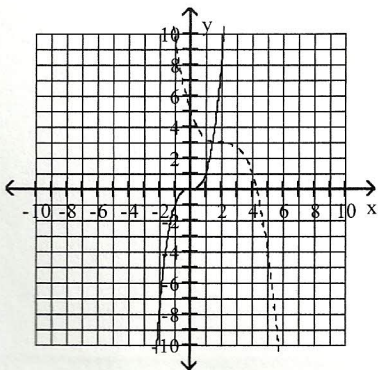
A)



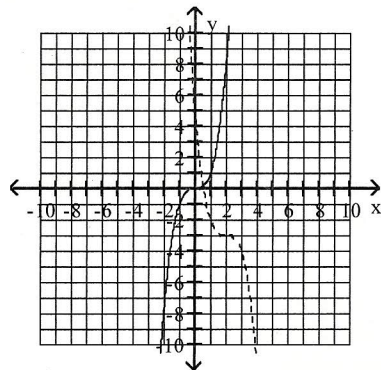
B)



C)



D)



Solve the following problem.

10) A developer wants to enclose a rectangular grassy lot that borders a city street for parking. If the developer has 344 feet of fencing and does not fence the side along the street, what is the largest area that can be enclosed?

A) 7396 ft²

B) 29,584 ft²

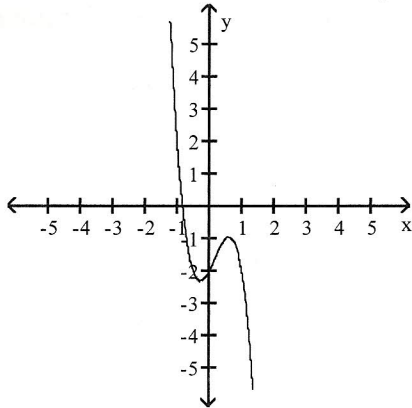
C) 14,792 ft²

D) 22,188 ft²

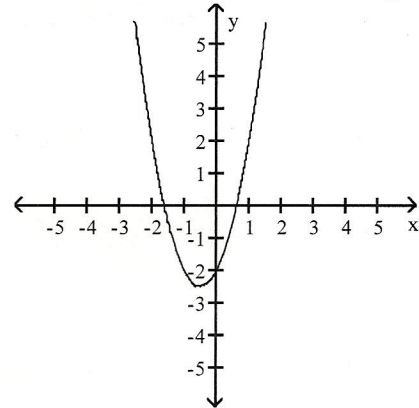
Use the Leading Coefficient Test to determine the end behavior and match the graph.

11) $f(x) = -4x^3 + 2x^2 + 2x - 2$

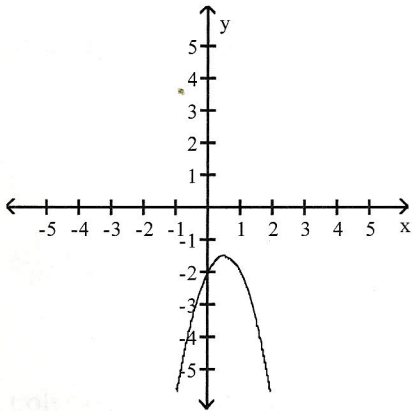
A) rises to the left and falls to the right



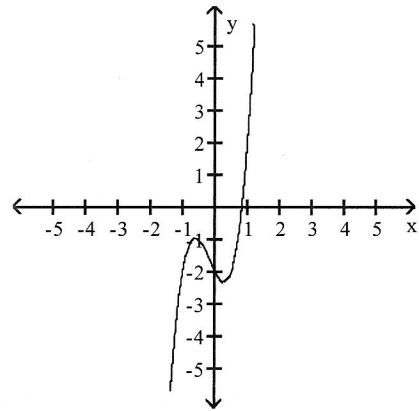
B) rises to the left and rises to the right



C) falls to the left and falls to the right



D) falls to the left and rises to the right



Find the zeros for the polynomial function and give the multiplicity for each zero. State whether the graph crosses the x-axis or touches the x-axis and turns around, at each zero.

12) $f(x) = x^3 + x^2 - 12x$

A) 0, multiplicity 1, crosses the x-axis
4, multiplicity 1, crosses the x-axis
-3, multiplicity 1, crosses the x-axis

B) -4, multiplicity 2, touches the x-axis and turns around
3, multiplicity 1, crosses the x-axis

C) 0, multiplicity 1, crosses the x-axis
-4, multiplicity 1, crosses the x-axis
3, multiplicity 1, crosses the x-axis

D) 0, multiplicity 1, touches the x-axis and turns around;
-4, multiplicity 1, touches the x-axis and turns around;
3, multiplicity 1, touches the x-axis and turns around

Use synthetic division and the remainder theorem to find the function value.

13) $f(x) = x^5 - 2x^4 - 3x^3 + 8$; $f(4)$

A) 28

B) -696

C) 328

D) -328

Find all the zeros of the function using synthetic division.

14) $f(x) = x^3 + 8x^2 - x - 8$

A) {1, -1, -8}

B) {-1, -2, -4}

C) {1, -2, 4}

D) {1, -1, 8}

List all possible Rational Zeros.

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

A) $\pm \frac{1}{2}, \pm 1, \pm 2, \pm 4, \pm 8$

B) $\pm \frac{1}{4}, \pm \frac{1}{2}, \pm 1, \pm 2, \pm 4, \pm 8$

C) $\pm \frac{1}{8}, \pm \frac{1}{4}, \pm \frac{1}{2}, \pm 1, \pm 2, \pm 4, \pm 8$

D) $\pm \frac{1}{2}, \pm 1, \pm 2, \pm 4$

Solve the polynomial equation, using the Rational Zero Theorem and Descartes Rules of Signs to find the rational zero, then factor or use quadratic formula to solve for the other roots.

16) $x^3 - 8x^2 + 19x - 14 = 0$

A) {1, -1, 14}

B) $\{2, 3 + \sqrt{2}, 3 - \sqrt{2}\}$

C) $\{-2, 6 + \sqrt{2}, 6 - \sqrt{2}\}$

D) $\{2, 6 + \sqrt{14}, 6 - \sqrt{14}\}$

Solve the polynomial equation, using the Rational Zero Theorem and synthetic division to find the first rational zero, then factor or use quadratic formula to solve for the other roots.

17) $4x^3 - 19x^2 + 19x + 6 = 0$

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

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

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

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

Find the vertical asymptote(s) for the function.

18) $\frac{x - 64}{x^2 - 15x + 54}$

A) $x = -9, x = -6$

C) $x = 9, x = 6, x = -64$

B) $x = 9, x = 6$

D) $x = -64$

Find the slant asymptote for the function, if it exists.

19) $f(x) = \frac{x^2 - 9x + 2}{x + 7}$

A) $y = x + 11$

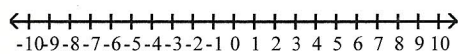
C) $x = y + 9$

B) $y = x - 16$

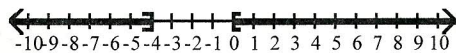
D) no slant asymptote

Solve the polynomial inequality and graph the solution on the number line.

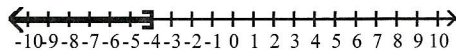
20) $x^2 + 4x \geq 0$



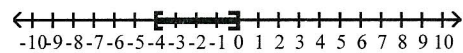
A) $(-\infty, -4] \cup [0, \infty)$



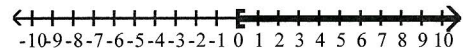
C) $(-\infty, -4]$



B) $[-4, 0]$

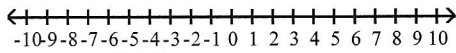


D) $[0, \infty)$



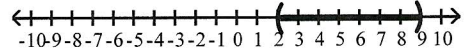
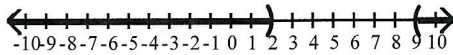
Solve the rational inequality and graph on the number line.

21) $\frac{7}{x-2} < 1$



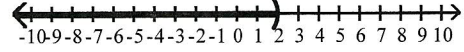
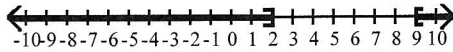
A) $(-\infty, 2)$ or $(9, \infty)$

B) $(2, 9)$



C) $(-\infty, 2]$ or $[9, \infty)$

D) $(-\infty, 2)$



Solve the problem.

- 22) y varies directly as x and inversely as the square of z .
 $y = 40$ when $x = 36$ and $z = 3$. Find y when $x = 93$ and $z = 2$.

A) 465

B) 45.93

C) 232.5

D) 155

Solve the problem.

- 23) If the voltage, V , in an electric circuit is held constant, the current, I , is inversely proportional to the resistance, R . If the current is 140 milliamperes when the resistance is 4 ohms, find the current when the resistance is 28 ohms.
- A) 980 milliamperes B) 973 milliamperes C) 80 milliamperes D) 20 milliamperes

Find the coordinates of the vertex.

24) $f(x) = (x + 5)^2 + 9$

A) $(9, -25)$

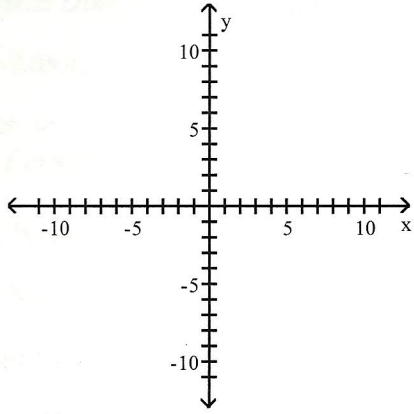
B) $(-9, 5)$

C) $(-5, 9)$

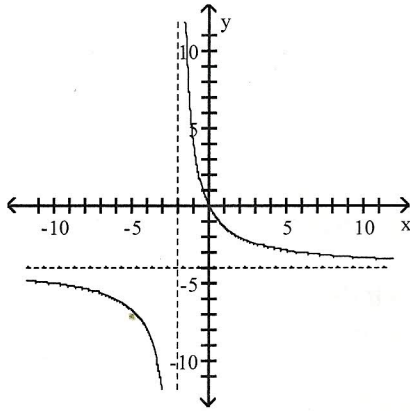
D) $(9, -5)$

Graph the rational function.

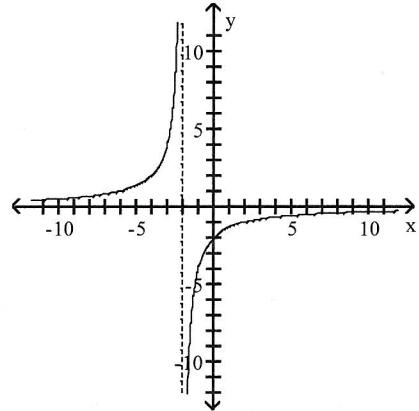
25) $f(x) = \frac{-4x}{x+2}$



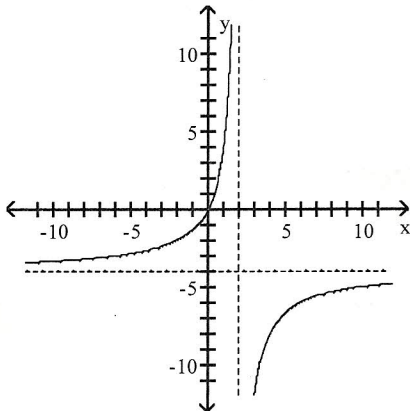
A)



B)



C)



D)

