Chapter 3 Practice Test

Directions:

This is a 30-question practice test. It does not count toward your overall score, and you may take it as many times as you choose. Once you've completed a take, click on the **Guide** button in the **Results** section below for a study guide covering the questions that you missed.

1) QID: 42701

The points $A(4,-2)$, $B(-3,5)$, and $C(1,-2)$ determine a triangle. Find the distance between the midpoints of sides AC and BC.

- ○ $\dfrac{7\sqrt{2}}{2}$
- ○ $\sqrt{2}+7$
- ○ $\sqrt{2}-7$
- ○ $\sqrt{2}$
- ○ None of the above

2) QID: 43940

Given the equation.
$$x^2 + 6\sqrt{5}x + y^2 + 4\sqrt{2}y = 5$$
complete the square for both x and y and find the equation of the circle.

- ○ $\left(x+3\sqrt{5}\right)^2 + \left(y+2\sqrt{2}\right)^2 = 58$
- ○ $\left(x+3\sqrt{5}\right)^2 + \left(y+2\sqrt{2}\right)^2 = 24$
- ○ $\left(x+3\sqrt{5}\right)^2 + \left(y+2\sqrt{2}\right)^2 = 53$
- ○ $\left(x+3\sqrt{5}\right)^2 + \left(y+2\sqrt{2}\right)^2 = 18$
- ○ None of the above

3) QID: 43975

Find the center and radius of the circle with the following equation:
$$5x^2 + 5y^2 - 40x + 60y + 215 = 0$$

- ○ $(4,\ -6),\ 3$
- ○ $(4,\ -6),\ 9$
- ○ $(-4,\ 6),\ 9$
- ○ $(-4,\ -6),\ 3$
- ○ None of the above

4) QID: 44045

What is the radius of the circle between and tangent to the circles with these equations:
$$(x+6)^2 + (y+8)^2 = 1$$
$$(x+5)^2 + (y-8)^2 = 1$$

- $\dfrac{\sqrt{257}}{2}$
- $\dfrac{\sqrt{257} - 3}{2}$
- $\sqrt{257} + 2$
- $\sqrt{257}$
- None of the above

5) QID: 44469

Find the x-intercepts of the graph of the quadratic function.
$$y = 3x^2 - 5x - 8$$

- $(1, 0), \left(-\dfrac{3}{8}, 0\right)$
- $(-1, 0), \left(\dfrac{8}{3}, 0\right)$
- $(-1, 0), \left(\dfrac{3}{8}, 0\right)$
- $(1, 0), \left(-\dfrac{8}{3}, 0\right)$
- None of the above

6) QID: 44738

Given the function
$$f(x) = \begin{cases} -3x & \text{if} & x < -4 \\ 2x - 3 & \text{if} & -4 \le x \le 1 \\ -5x & \text{if} & x > 1 \end{cases}$$

evaluate $f(1)$.

- -1
- 1
- -3
- -5
- None of the above

7) QID: 26185

Over what interval is the following piecewise function increasing?
$$f(x) = \begin{cases} -1 - x & \text{for } x < -2 \\ 3x + 7 & \text{for } -2 \le x \le -1 \\ 1 & \text{for } x > -1 \end{cases}$$

- $(-\infty, -2)$
- $[-2, -1]$
- $(-1, \infty)$
- The function is not increasing over any range.
- None of the above

A rope 18 feet long is cut into two pieces. One piece is used to form a circle and the other used to form a square. Find a function representing the area of both square and circle as a function of the length of one side of the square.
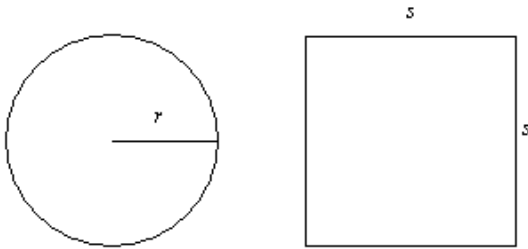
○ $\dfrac{81 + 4s^2 - 36s + \pi s^2}{\pi}$

○ $\dfrac{81 + \pi s^2}{\pi}$

○ $\dfrac{81 + 4s^2 + \pi s^2}{\pi}$

○ $\dfrac{81 + 4s^2 + 36\pi s + \pi s^2}{\pi}$

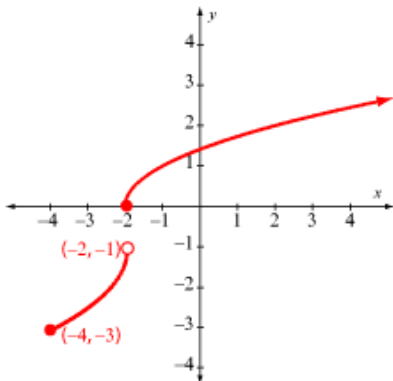○ None of the above

What is the range of the following function?

○ $(-\infty, -1) \cup [1, \infty)$

○ $(-\infty, 0) \cup [2, \infty)$

○ $(-\infty, -1) \cup [0, \infty)$

○ $(-\infty, 1) \cup [2, \infty)$
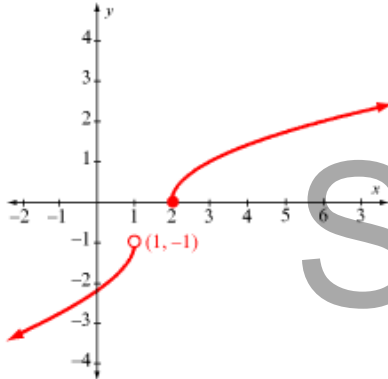
What is the domain of the following function?

○ $(-4, \infty)$

○ $[-3, -1) \cup (0, \infty)$

○ $[-4, -2) \cup [-2, \infty)$

○ $[-4, \infty)$

○ None of the above

11) QID: 45115

Given $f(x) = \dfrac{7}{x^3}$, find the range for the function f.

- $y > 0$
- $y \neq 0$
- $-7 \leq y \leq 7$
- $y < 0$
- None of the above

12) QID: 9419

Given the function

$f(x) = \sqrt{4 - x^2}$,

find its domain.

- $x \leq 2$
- $x \geq 2$
- $-2 \leq x \leq 2$
- $x \leq -2$ or $x \geq 2$
- None of the above.

13) QID: 27551

Given the function

$f(x) = \dfrac{x^2 + 3x - 40}{x^2 - 4x - 12}$,

find its domain.

- $\mathbb{R}$
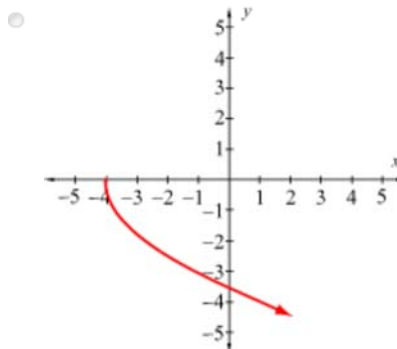- $\mathbb{R} \setminus \{-2, 6\}$
- $\mathbb{R} \setminus \{1, 3\}$
- $\mathbb{R} \setminus \{x < 1\}$
- None of the above

14) QID: 46055

Determine the equation of the line, in slope-intercept form, that is parallel to $-3x - 4y = -5$ and contains $(-3, -4)$.

- $y = -\dfrac{3}{4}x - \dfrac{25}{4}$
- $y = -\dfrac{4}{3}x + \dfrac{4}{25}$
- $y = \dfrac{3}{4}x - \dfrac{25}{4}$
- $y = -\dfrac{3}{4}x + \dfrac{4}{25}$
- None of the above

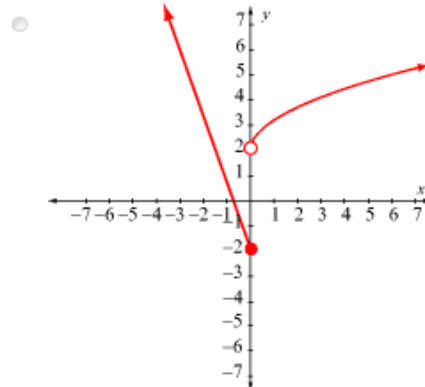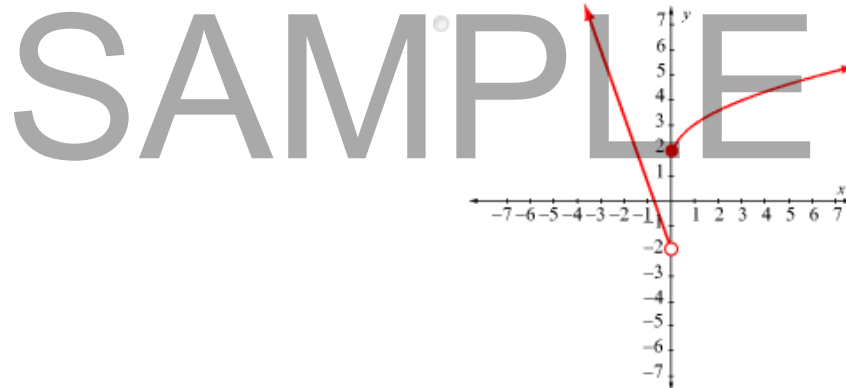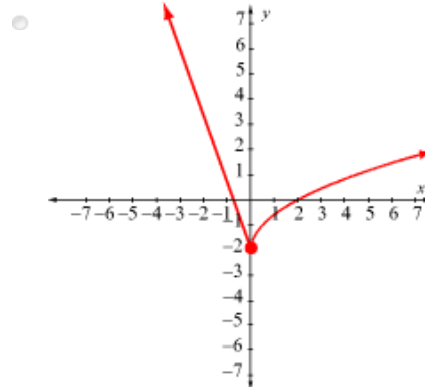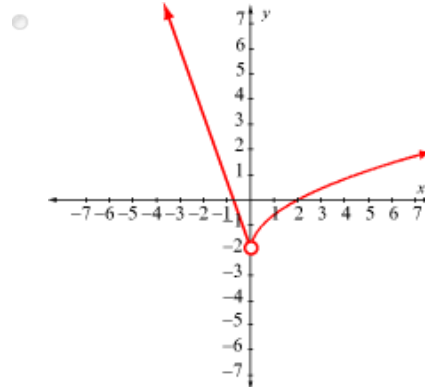Which of the following graphs most likely represents $y = -\sqrt{3x + 12}$?
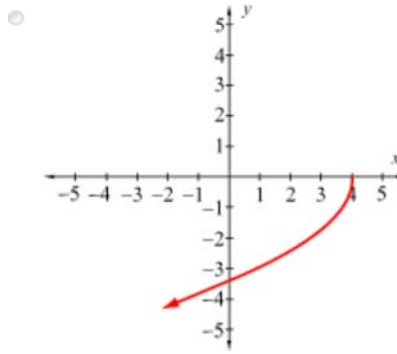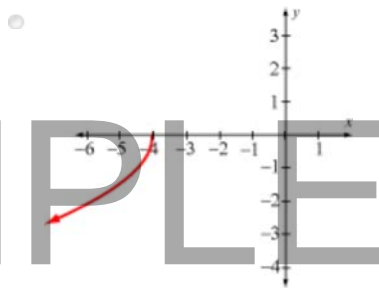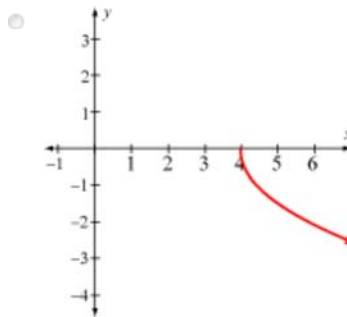
In which quadrant do the points of the graph of $y = |x| - 8$ occur?

- I and IV
- I and II
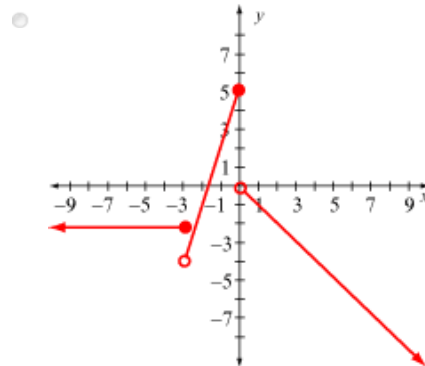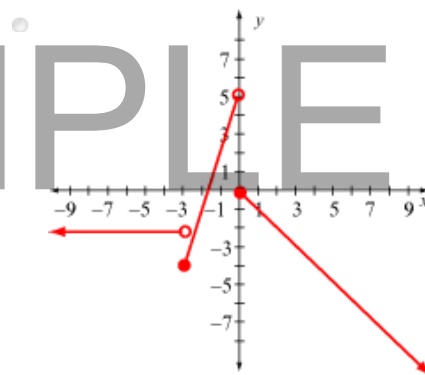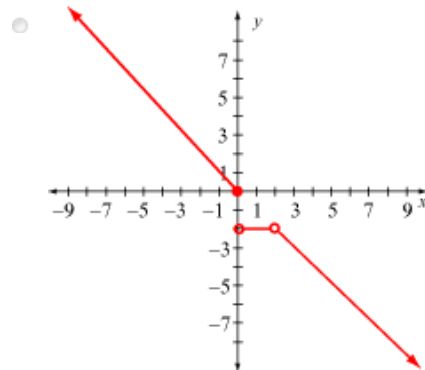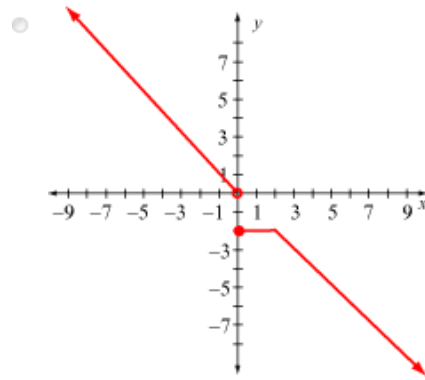- I, II and IV
- I, II, III, and IV
- None of the above

Find the graph of the function.

$$f(x) = \begin{cases} \sqrt{x} + 2, & x \geq 0 \\ -3x - 2, & x < 0 \end{cases}$$

SAMPLE

Graph:
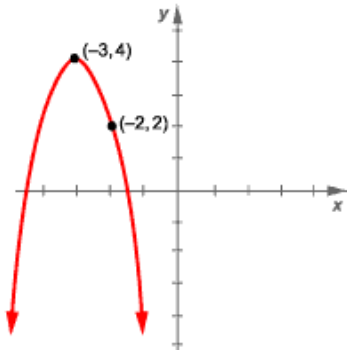
$$y = \begin{cases} -2 & \text{if } x < -3 \\ 5 + 3x & \text{if } -3 \le x < 0 \\ -x & \text{if } x \ge 0 \end{cases}$$

Write the equation for the parabola whose graph is shown below.

- $y = -(x-2)^2 + 2$
- $y = -\frac{1}{2}(x+3)^2 + 4$
- $y = -2(x-2)^2 + 2$
- $y = -2(x+3)^2 + 4$
- None of the above

Suppose the vertex of a parabola is in the fourth quadrant and the parabola opens downwards. What can be determined about the value of a and the discriminant?

- a is negative and the discriminant is positive
- a is positive and the discriminant is negative
- a is negative and the discriminant is negative
- a is negative and the discriminant is zero
- None of the above

In a baseball game, a batter pops a ball straight up in the air and the height of the ball is given by the function $f(t) = -16t^2 + 128t$, where t is the elapsed time in seconds. A seagull then plucks the ball out of the air and swallows it. If the ball never reached its maximum height, and the seagull had an altitude of 192 feet when it swallowed the ball, find the time when the seagull ate the ball.

- 1
- 2
- 3
- 4
- None of the above

A fence of 300 feet is used to enclose a rectangular garden. Find the maximum area possible for the garden.

- 75 square feet
- 3000 square feet
- 5000 square feet
- 3600 square feet
- None of the above

23) QID: 47144

Beginning with the graph of the function $y = 3(x+3)^2 - 4$, which of the following shows the changes you would make to the function so that the vertex lies at $(2, 4)$ and the parabola becomes 4 times wider and it opens in a negative direction?

○ $y = -\frac{3}{4}(x-2)^2 + 4$

○ $y = -\frac{3}{4}(x-2)^2$

○ $x = -\frac{3}{4}(y-2)^2 + 4$

○ $y = \frac{1}{2}(x-2)^2 + 4$

○ None of the above

24) QID: 48911

If $f(x)$ is an even function and the point $(-5, -3)$ lies on the graph of $f(x)$, identify an additional point on the graph.

○ $(5, 3)$

○ $(-5, -3)$

○ $(-5, 3)$
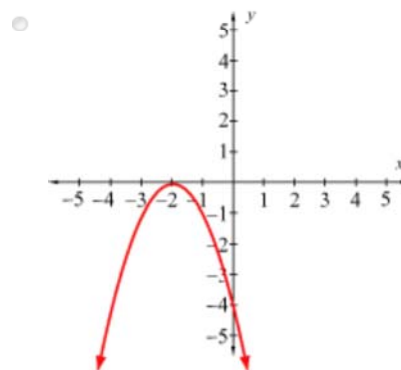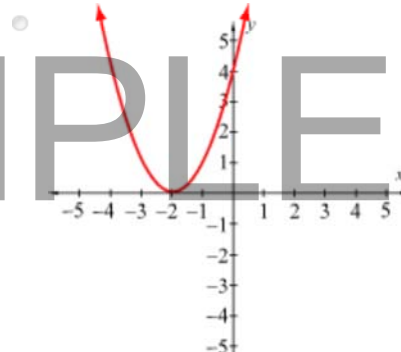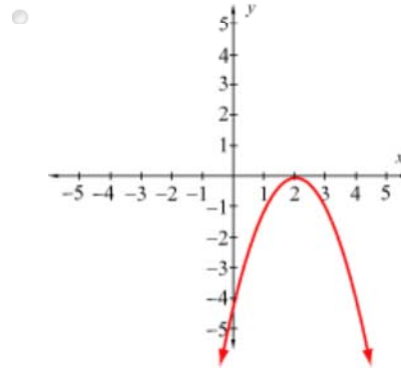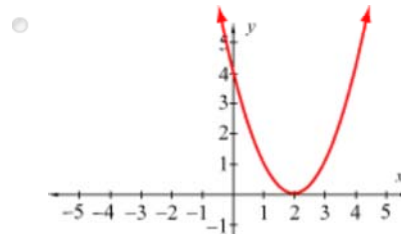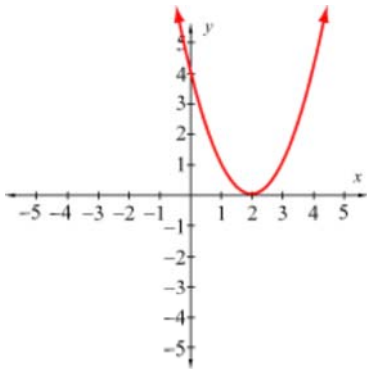
○ $(-5, 0)$

○ None of the above

25) QID: 53934

Determine if the function is even, odd, or neither:
$f(x) = 2x^5 - x^3$

○ Even

○ Odd

○ Neither

Reflect the graph across the *x*-axis.

○

○

○

○

27) QID: 46460

Find $(f - g)(x)$ and $(f + g)(3)$ for $f(x) = 5x^2 - 3x + 4$ and $g(x) = 3 - 3x + 2x^2$.

- $(f - g)(x) = 3x^2 + 1,\ (f + g)(3) = 28$
- $(f - g)(x) = 8x^2 - 6x + 6,\ (f + g)(3) = 45$
- $(f - g)(x) = 8x^2 - 6x + 6,\ (f + g)(3) = 60$
- $(f - g)(x) = 3x^2 + 1,\ (f + g)(3) = 52$
- None of the above

28) QID: 46546

If $f(x) = 3 + 2x$ and $g(x) = x^2 + 2$, find (a) $(f \circ g)(x)$ and (b) $(g \circ f)(x)$.

- (a) $x^2 + 2x + 5$
  (b) $2x^2 + 7$
- (a) $4x^2 + 12x + 11$
  (b) $x^2 + 2x - 5$
- (a) $x^2 + 2x - 5$
  (b) $2x^2 + 11x$
- (a) $2x^2 + 7$
  (b) $4x^2 + 12x + 11$
- None of the above

29) QID: 24978

Find the difference quotient
$$D(x) = \frac{f(x+h) - f(x)}{h}$$
for $f(x) = \sqrt{x}$.

- $D(x) = \dfrac{\sqrt{h}}{h}$
- $D(x) = \dfrac{\sqrt{x} + h - \sqrt{x}}{h}$
- $D(x) = \dfrac{\sqrt{x + h} - \sqrt{x}}{h}$
- $D(x) = \dfrac{\sqrt{x - h} - \sqrt{x}}{h}$
- None of the above

Find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$ for the

function $f(x) = -2x^2 + x + 6$.

- ○ $-4x - 2h + 1 - \dfrac{4x^2 + 2x + 12}{hx}$
- ○ $-4x - 4h + 1$
- ○ $-4x - 4h + 7$
- ○ $-4x - 2h + 1$
- ○ None of the above

SAMPLE