

# Quadratics #2

2

$$(x^2 - 3) - (-3x^2 + 5)$$

Which of the following expressions is equivalent to the one above?

- A)  $4x^2 - 8$
- B)  $4x^2 - 2$
- C)  $-2x^2 - 8$
- D)  $-2x^2 - 2$

6

In the equation  $(ax + 3)^2 = 36$ ,  $a$  is a constant. If  $x = -3$  is one solution to the equation, what is a possible value of  $a$ ?

- A)  $-11$
- B)  $-5$
- C)  $-1$
- D)  $0$

9

$$9ax + 9b - 6 = 21$$

Based on the equation above, what is the value of  $ax + b$ ?

- A) 3
- B) 6
- C) 8
- D) 12

24

$$h(t) = -16t^2 + 110t + 72$$

The function above models the height  $h$ , in feet, of an object above ground  $t$  seconds after being launched straight up in the air. What does the number 72 represent in the function?

- A) The initial height, in feet, of the object
- B) The maximum height, in feet, of the object
- C) The initial speed, in feet per second, of the object
- D) The maximum speed, in feet per second, of the object

35

$$\begin{aligned} y &= x^2 - 4x + 4 \\ y &= 4 - x \end{aligned}$$

If the ordered pair  $(x, y)$  satisfies the system of equations above, what is one possible value of  $x$ ?

8

$$x + 1 = \frac{2}{x + 1}$$

In the equation above, which of the following is a possible value of  $x + 1$ ?

- A)  $1 - \sqrt{2}$
- B)  $\sqrt{2}$
- C) 2
- D) 4

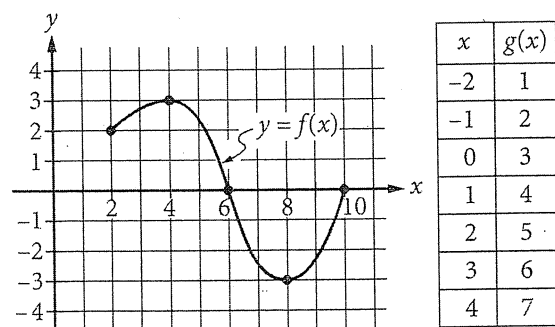
14

Which of the following is a value of  $x$  for which the

expression  $\frac{-3}{x^2 + 3x - 10}$  is undefined?

- A)  $-3$
- B)  $-2$
- C) 0
- D) 2

30



The complete graph of the function  $f$  and a table of values for the function  $g$  are shown above. The maximum value of  $f$  is  $k$ . What is the value of  $g(k)$ ?

- A) 7
- B) 6
- C) 3
- D) 0

4 NC

Which of the following complex numbers is equal to  $(5 + 12i) - (9i^2 - 6i)$ , for  $i = \sqrt{-1}$ ?

- A)  $-14 - 18i$
- B)  $-4 - 6i$
- C)  $4 + 6i$
- D)  $14 + 18i$

5 NC

If  $f(x) = \frac{x^2 - 6x + 3}{x - 1}$ , what is  $f(-1)$ ?

- A)  $-5$
- B)  $-2$
- C)  $2$
- D)  $5$

7 NC

$$x^2 + 6x + 4$$

Which of the following is equivalent to the expression above?

- A)  $(x + 3)^2 + 5$
- B)  $(x + 3)^2 - 5$
- C)  $(x - 3)^2 + 5$
- D)  $(x - 3)^2 - 5$

10 NC

$$ax^3 + bx^2 + cx + d = 0$$

In the equation above,  $a$ ,  $b$ ,  $c$ , and  $d$  are constants. If the equation has roots  $-1$ ,  $-3$ , and  $5$ , which of the following is a factor of  $ax^3 + bx^2 + cx + d$ ?

- A)  $x - 1$
- B)  $x + 1$
- C)  $x - 3$
- D)  $x + 5$

12 NC

The function  $f$  is defined by  $f(x) = (x + 3)(x + 1)$ . The graph of  $f$  in the  $xy$ -plane is a parabola. Which of the following intervals contains the  $x$ -coordinate of the vertex of the graph of  $f$ ?

- A)  $-4 < x < -3$
- B)  $-3 < x < 1$
- C)  $1 < x < 3$
- D)  $3 < x < 4$

13 NC

Which of the following expressions is equivalent to

$$\frac{x^2 - 2x - 5}{x - 3}?$$

- A)  $x - 5 - \frac{20}{x - 3}$
- B)  $x - 5 - \frac{10}{x - 3}$
- C)  $x + 1 - \frac{8}{x - 3}$
- D)  $x + 1 - \frac{2}{x - 3}$

20 NC

$$(7532 + 100y^2) + 10(10y^2 - 110)$$

The expression above can be written in the form  $ay^2 + b$ , where  $a$  and  $b$  are constants. What is the value of  $a + b$ ?

15 NC

The expression  $\frac{1}{3}x^2 - 2$  can be rewritten as  $\frac{1}{3}(x - k)(x + k)$ , where  $k$  is a positive constant.

What is the value of  $k$ ?

- A)  $2$
- B)  $6$
- C)  $\sqrt{2}$
- D)  $\sqrt{6}$