Date Completed: _____
Mentor Initials: _____



# Quadratics (Intermediate)

## Multiple Choice

**1.** In the quadratic equation $x^2 - k = 0$, $k$ is a constant. For which of the following values of $k$ will the equation have no real solutions?

A) $-4$
B) $0$
C) $1$
D) $4$

**2.** In the $xy$-plane, the graph of $y = x^2 + bx + c$, where $b$ and $c$ are constants, has roots at $x = -5$ and $x = 6$. What is the value of $b$?

A) $-30$
B) $-1$
C) $1$
D) $30$

**3.** In the standard $(x, y)$ coordinate plane, the graph of $y = 24(x + 12)^2 - 21$ is a parabola. What are the coordinates of the vertex of the parabola?

A) $(24, 21)$
B) $(12, -21)$
C) $(-12, -21)$
D) $(-12, 21)$

**4.** If the quadratic equation $x^2 - kx + 36 = 0$ has one real solution, what is the value of $k$?

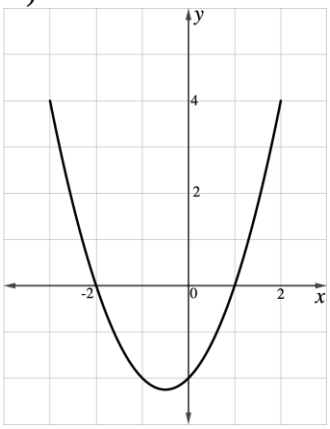
A) $-6$
B) $0$
C) $6$
D) $12$

**5.** The graph of the quadratic function $f$ crosses the $x$-axis at $(3,0)$ and $(-5,0)$. Which of the following could define $f$ ?

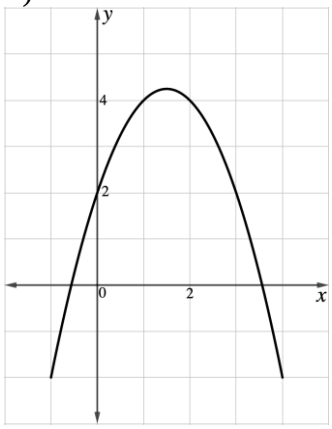
A) $x^2 + 2x - 15 = 0$
B) $x^2 - 2x - 15 = 0$
C) $x^2 - 15x - 2 = 0$
D) $(x + 3)^2 - 5 = 0$

**6.** Which of the following could be the graph of $y = x^2 - 3x + 2$?

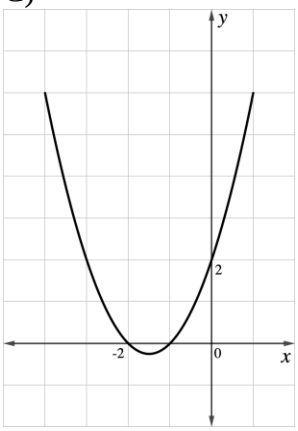
A)



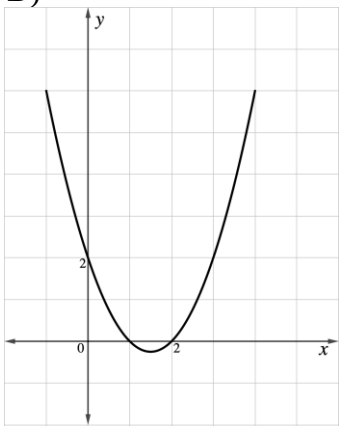

B)




C)



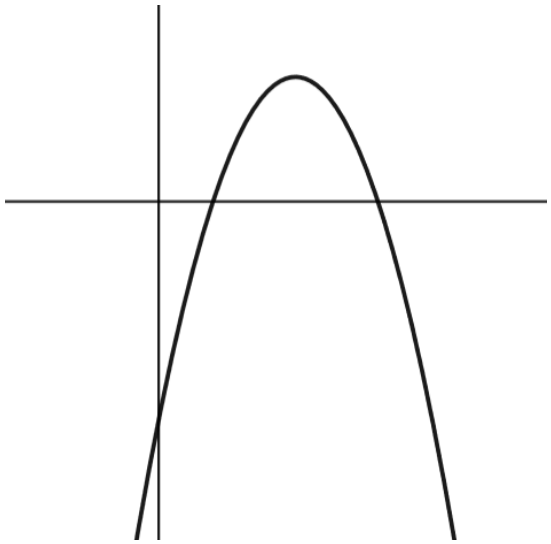

D)




**7.** A candy store owner found that when peanut butter cups were sold for $\$1.50$, a total of 75 peanut butter cups were sold each day. For every $\$0.20$ decrease in the price of a peanut butter cup, 5 more peanut butter cups were sold each day. Which equation models the total amount collected $P$, in dollars, from peanut butter cup sales each day, where $x$ is the number of $\$.20$ price decreases?

A) $P = (1.50 - x)(75 - 5x)$
B) $P = (1.50 - x)(75 + 5x)$
C) $P = (1.50 - .20x)(75 - 5x)$
D) $P = (1.50 - .20x)(75 + 5x)$

**8.**



The graph of the function $g$ is shown. Which of the following could define $g$?

A) $g(x) = x^2 - 3x + 4$
B) $g(x) = x^2 + 5x - 4$
C) $g(x) = -x^2 - 3x + 4$
D) $g(x) = -x^2 + 5x - 4$

**9.** If the graph of $y = -x^2 + 4x + a$ in the $xy$-plane does NOT touch the $x$-axis, which of the following is a possible value of $a$ ?

A) $-6$
B) $-4$
C) $0$
D) $4$

**10.** $$h(t) = -16t^2 + 64t + 80$$

The function above models the height, $h$, in meters, of an object $t$ seconds after it is launched straight up in the air. Which of the following methods can be used to find $n$, the time, in seconds, at which the object reaches its maximum height?

A) Rewrite $h$ as $h(t) = -16(t + 1)(t - 5)$, with the constant 1 representing $n$.
B) Rewrite $h$ as $h(t) = -16(t + 1)(t - 5)$, with the constant 5 representing $n$.
C) Rewrite $h$ as $h(t) = -16(t - 2)^2 + 144$, with the constant 2 representing $n$.
D) Rewrite $h$ as $h(t) = -16(t - 2)^2 + 144$, with the constant 144 representing $n$.

## Grid In

**11.** What is the sum of the solutions to the quadratic equation $6x^2 - 5x + 10 = 0$ ?

**12.** In the $xy$-plane, the graph of the quadratic function $f$ is a parabola with vertex $(-3, 2)$. The function $g$ is defined by $g(x) = f(x) + 1$, and the graph of $g$ has vertex $(h, k)$. What is the value of $k$?

**13.** $f(x) = 4x^2 - 3x - 7$

For the function $f$ shown above, for what value of $x$ does $f(x)$ obtain its minimum value?

**14.** $4(x - 50)^2 = 100$

What is the smaller of the two solutions to the equation shown above?

**15.** $(x - 3) = (x + 2)(x - 3)$

What is the sum of the solutions to the given equation?