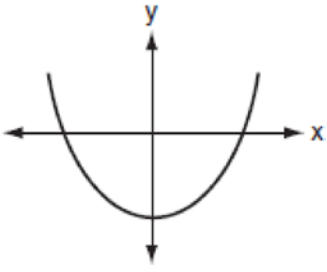
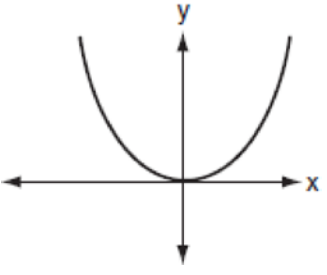
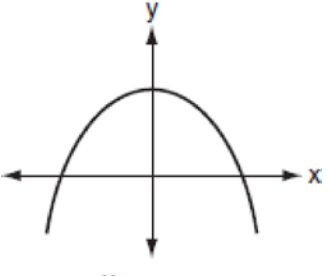
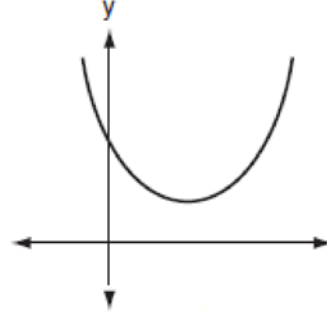
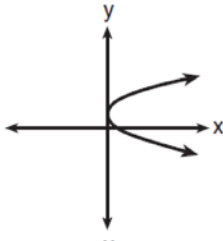
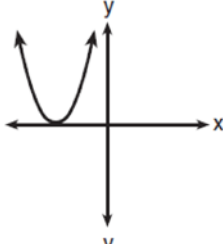
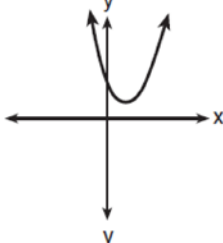
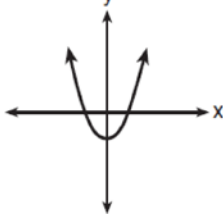


A.REI.B.4: Using the Discriminant 1

1 Which graph represents a quadratic function with a negative discriminant?

- 1) 
- 2) 
- 3) 
- 4) 

2 If zero is the value of the discriminant of the equation $ax^2 + bx + c = 0$, which graph best represents $y = ax^2 + bx + c$?

- 1) 
- 2) 
- 3) 
- 4) 

3 If the roots of $ax^2 + bx + c = 0$ are real, rational, and equal, what is true about the graph of the function $y = ax^2 + bx + c$?

- 1) It intersects the x -axis in two distinct points.
- 2) It lies entirely below the x -axis.
- 3) It lies entirely above the x -axis.
- 4) It is tangent to the x -axis.

- 4 Which statement must be true if a parabola represented by the equation $y = ax^2 + bx + c$ does not intersect the x -axis?
- 1) $b^2 - 4ac = 0$
 - 2) $b^2 - 4ac < 0$
 - 3) $b^2 - 4ac > 0$, and $b^2 - 4ac$ is a perfect square.
 - 4) $b^2 - 4ac > 0$, and $b^2 - 4ac$ is not a perfect square.
- 5 Which is a true statement about the graph of the equation $y = x^2 - 7x - 60$?
- 1) It is tangent to the x -axis.
 - 2) It does not intersect the x -axis.
 - 3) It intersects the x -axis in two distinct points that have irrational coordinates.
 - 4) It intersects the x -axis in two distinct points that have rational coordinates.
- 6 Jacob is solving a quadratic equation. He executes a program on his graphing calculator and sees that the roots are real, rational, and unequal. This information indicates to Jacob that the discriminant is
- 1) zero
 - 2) negative
 - 3) a perfect square
 - 4) not a perfect square
- 7 If the roots of a quadratic equation are real, irrational, and unequal, the discriminant could have a value of
- 1) 1
 - 2) 0
 - 3) 8
 - 4) -6
- 8 The roots of a quadratic equation are real, rational, and equal when the discriminant is
- 1) -2
 - 2) 2
 - 3) 0
 - 4) 4
- 9 Which number is the discriminant of a quadratic equation whose roots are real, unequal, and irrational?
- 1) 0
 - 2) -5
 - 3) 7
 - 4) 4
- 10 Which equation has real, rational, and unequal roots?
- 1) $x^2 + 10x + 25 = 0$
 - 2) $x^2 - 5x + 4 = 0$
 - 3) $x^2 - 3x + 1 = 0$
 - 4) $x^2 - 2x + 5 = 0$
- 11 Which equation has roots that are real, rational, and unequal?
- 1) $x^2 + x + 1 = 0$
 - 2) $x^2 - 4x + 4 = 0$
 - 3) $x^2 - 4 = 0$
 - 4) $x^2 - 2 = 0$
- 12 Which equation has rational roots?
- 1) $x^2 + 8x - 8 = 0$
 - 2) $x^2 + 8x + 9 = 0$
 - 3) $2x^2 + 4x + 5 = 0$
 - 4) $3x^2 + 8x + 4 = 0$
- 13 How many real solutions does the equation $x^2 - 2x + 5 = 0$ have? Justify your answer.
- 14 Given the function $y = f(x)$, such that the entire graph of the function lies above the x -axis. Explain why the equation $f(x) = 0$ has no real solutions.

A.REI.B.4: Using the Discriminant 1

Answer Section

1 ANS: 4 REF: 080620b

2 ANS: 2 REF: 011020b

3 ANS: 4

If the roots of the quadratic are equal, the graph of the function intersects the x -axis only once.

REF: 010313b

4 ANS: 2

If a parabola does not intersect the x -axis, the roots are imaginary, and the discriminant is less than 0.

REF: 010416b

5 ANS: 4

$$b^2 - 4ac = (-7)^2 - 4(1)(-60) = 289$$

REF: 010713b

6 ANS: 3 REF: 060103b

7 ANS: 3 REF: 061623a2

8 ANS: 3 REF: 010201b

9 ANS: 3 REF: 060717b

10 ANS: 2

$$(-5)^2 - 4(1)(4) = 9$$

REF: 011506a2

11 ANS: 3

$$0^2 - 4(1)(-4) = 16$$

REF: 010817b

12 ANS: 4 REF: 089828siii

13 ANS:

$$b^2 - 4ac = (-2)^2 - 4(1)(5) = 4 - 20 = -16 \text{ None}$$

REF: 081529ai

14 ANS:

Since the graph lies entirely above the x -axis, there is no point on the graph where $y = 0$.

REF: 080525b