

Semester 2 Final Review B
Quadratic Features**Write the answer as a point.**

<p>Example: Find the y-intercept of the graph $y = -2x^2 + 5x + 10$.</p> <p>The y-intercept is the point where $x=0$. So, $y = -2(0)^2 + 5(0) + 10 = 10$ The y-int is: $\boxed{(0, 10)}$.</p>	1. Find the y -intercept of the graph $y = -4x^2 + 7x - 9$.
2. Find the y -intercept of the graph $y = 7x^2 + 12x - 4$.	3. Find the y -intercept of the graph $y = -x^2 - 5x + 8$.
4. Find the y -intercept of the graph $y = -5x^2 + x - 7$.	5. Find the y -intercept of the graph $y = 2x^2 - x + 11$.

<p>Example: Ruby is kicking a ball into the air. The path of the ball can be modeled by a quadratic equation where the point $(1, 8)$ represents the vertex and the x-axis represents the ground.</p> <p>Which equation(s) could represent the location of the ball when it hits the ground? Select all that apply.</p> <p>A. $0 = -(x - 1)(x - 8) \leftarrow$ vertex is $(4.5, 12.25)$ $\text{Vertex } x = \frac{1 + 8}{2} = \frac{9}{2} = 4.5$ $y = -((4.5) - 1)((4.5) - 8) = -(3.5)(-3.5) = 12.25$</p> <p>B. $0 = -(x + 1)^2 + 8 \leftarrow$ vertex is $(-1, 8)$</p> <p>$\boxed{\text{C. } 0 = -x^2 + 2x + 7}$ \leftarrow (see work below) vertex is $(1, 8)$ $\text{Vertex } x = \frac{-b}{2a} = \frac{-(-2)}{2(-1)} = \frac{-2}{-2} = 1$ $y = -(-1)^2 + 2(1) + 7 = -1 + 2 + 7 = 8$</p> <p>$\boxed{\text{D. } 0 = -(x - 1)^2 + 8}$ \leftarrow vertex is $(1, 8)$</p> <p>E. $0 = -x^2 - 2x - 7 \leftarrow$ (see work below) vertex is $(-1, 4)$ $\text{Vertex } x = \frac{-b}{2a} = \frac{-(-2)}{2(-1)} = \frac{-2}{-2} = -1$ $y = -(-1)^2 + 2(-1) + 7 = -1 - 2 + 7 = 4$</p> <p>F. $0 = -(x + 1)(x + 8) \leftarrow$ vertex is $(-4.5, 12.25)$ $\text{Vertex } x = \frac{(-1) + (-8)}{2} = \frac{-9}{2} = -4.5$ $y = -((-4.5) + 1)((-4.5) + 8) = -(-3.5)(3.5) = 12.25$</p>	<p>6. Fernando is kicking a ball into the air. The path of the ball can be modeled by a quadratic equation where the point $(9, 1)$ represents the vertex and the x-axis represents the ground.</p> <p>Which equation(s) could represent the location of the ball when it hits the ground? Select all that apply.</p> <p>A. $0 = -(x - 9)(x - 1)$</p> <p>B. $0 = -x^2 - 18x + 80$</p> <p>C. $0 = -(x - 9)^2 + 1$</p> <p>D. $0 = -x^2 + 18x - 80$</p> <p>E. $0 = -(x + 9)^2 - 1$</p> <p>F. $0 = -(x + 9)(x + 1)$</p>
--	--

7. Elisa is kicking a ball into the air. The path of the ball can be modeled by a quadratic equation where the point $(7, 6)$ represents the vertex and the x -axis represents the ground.

Which equation(s) could represent the location of the ball when it hits the ground? **Select all that apply.**

- A. $0 = -x^2 - 14x + 55$
- B. $0 = -(x + 7)(x - 6)$
- C. $0 = -x^2 + 14x - 43$
- D. $0 = -(x + 7)^2 - 6$
- E. $0 = -(x - 7)^2 + 6$
- F. $0 = -(x - 7)(x + 6)$

8. Autumn is kicking a ball into the air. The path of the ball can be modeled by a quadratic equation where the point $(1, 9)$ represents the vertex and the x -axis represents the ground.

Which equation(s) could represent the location of the ball when it hits the ground? **Select all that apply.**

- A. $0 = -(x + 2)(x - 4)$
- B. $0 = -(x + 1)^2 + 9$
- C. $0 = -(x - 2)(x + 4)$
- D. $0 = -x^2 + 2x + 8$
- E. $0 = -x^2 - 2x + 8$
- F. $0 = -(x - 1)^2 + 9$

9. Claire is kicking a ball into the air. The path of the ball can be modeled by a quadratic equation where the point $(0, 8)$ represents the vertex and the x -axis represents the ground.

Which equation(s) could represent the location of the ball when it hits the ground? **Select all that apply.**

- A. $0 = -(x)(x - 8)$
- B. $0 = -x^2 - 8$
- C. $0 = -(x + 8)^2$
- D. $0 = -(x - 8)^2$
- E. $0 = -x^2 + 8$
- F. $0 = -(x)(x + 8)$

10. Lily is kicking a ball into the air. The path of the ball can be modeled by a quadratic equation where the point $(5, 7)$ represents the vertex and the x -axis represents the ground.

Which equation(s) could represent the location of the ball when it hits the ground? **Select all that apply.**

- A. $0 = -(x - 5)^2 + 7$
- B. $0 = -x^2 + 10x - 18$
- C. $0 = -(x - 5)(x + 7)$
- D. $0 = -(x + 5)(x - 7)$
- E. $0 = -x^2 - 10x - 18$
- F. $0 = -(x + 5)^2 + 7$

Example:

What is the RANGE of $f(x) = -(x - 1)^2 - 8$?

"Range" is all real numbers that y can be. There are two things to look for:

1. the sign of a (if the front number of the whole equation is positive, it makes the range "greater than", or negative, it makes the range "less than.")

& 2. the vertex y (the number behind the $()^2$ in vertex form)

$$\begin{array}{c} \ominus(x-1)^2 \ominus 8 \\ \uparrow \qquad \uparrow \\ \text{less than} \quad -8 \end{array}$$

The range is all real numbers less than -8 .

11. What is the RANGE of $f(x) = -(x + 2)^2$?

12. What is the RANGE of $f(x) = -(x + 9)^2 + 3$?

13. What is the RANGE of $f(x) = (x - 4)^2 + 6$?

14. What is the RANGE of $f(x) = -(x - 2)^2 + 5$?

15. What is the RANGE of $f(x) = (x - 1)^2 - 3$?

Semester 2 Final Review B
Quadratic Features Answers:

1. (0, -9)	2. (0, -4)	3. (0, 8)	4. (0, -7)	5. (0, 11)
6. C & D	7. C & E	8. A, D & F	9. E	10. A & B
11. All real numbers less than 0.	12. All real numbers less than 3.	13. All real numbers greater than 6.	14. All real numbers less than 5.	15. All real numbers greater than -3.