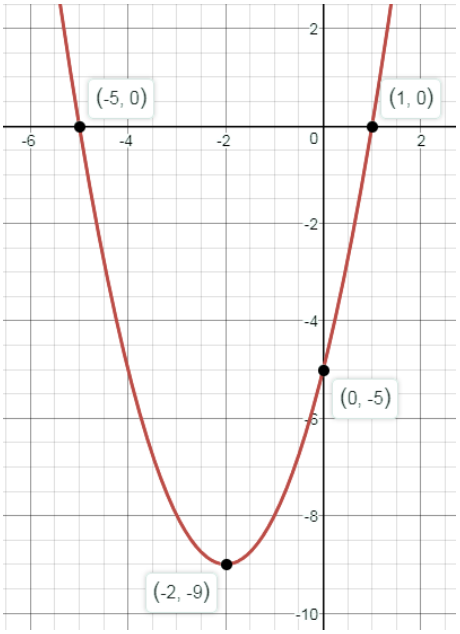
**Algebra 1: Graphing Quadratics** **Name** _____ **PD** _____
**OPEN NOTES Pop Quiz**

**Use the graph of the quadratic function to answer the following questions. <u>Write explanations in complete sentences.</u>**




1. What is the vertex of the parabola?

   Vertex = (–2, –9)

2. Is the vertex a maximum or minimum? Explain.

   Minimum. All the y-values on the graph are greater than or equal to –9.

3. What is the axis of symmetry for the parabola?

   $x = -2$

4. What is the $y$–intercept of the parabola?

   $y$-intercept = (0, –5)

5. What are the zeros or $x$-intercepts of the parabola?

   (–5, 0) and (1, 0)

6. Is the value of '$a$' positive or negative? How do you know?

   The '$a$' is positive because the parabola opens upward.

7. Is the value of '$c$' positive or negative? How do you know?

   The '$c$' is negative because the parabola is shifted downwards from the x-axis.

**Use your notes to answer each of the following questions about quadratic functions. <u>Write explanations in complete sentences.</u>**

8. What is the definition of a quadratic function?

   A function where the highest degree or exponent is squared ($x^2$).

9. What is the quadratic parent function?

   $y = x^2$

10. What is the standard form for a quadratic function?

    $y = ax^2 + bx + c$, where $a \neq 0$.

11. What are 2 – 3 things the '$a$' value does to the parabola of a quadratic function?

    The '$a$' value determines if the parabola opens up or down. It also determines if the parabola is narrow or wide.

12. When a quadratic function is written in standard form what does the '$b$' value do to the parabola?

    The '$b$' value changes the axis of symmetry.

13. What is the formula for the axis of symmetry when a quadratic is written in standard form?

    $x = \frac{-b}{2a}$

14. What is the vertex form for a quadratic function?

    $y = a(x - h)^2 + k$

15. What does the '$h$' value represent in the vertex form of a quadratic function? How does the expression $(x \pm h)$ affect the parabola?

The '$h$' is the $x$-coordinate of the vertex and also the axis of symmetry. If the expression is written as $(x - h)$, the parabola shifts to the right $h$ units. If the expression $(x + h)$, the parabola shifts to the left $h$ units.

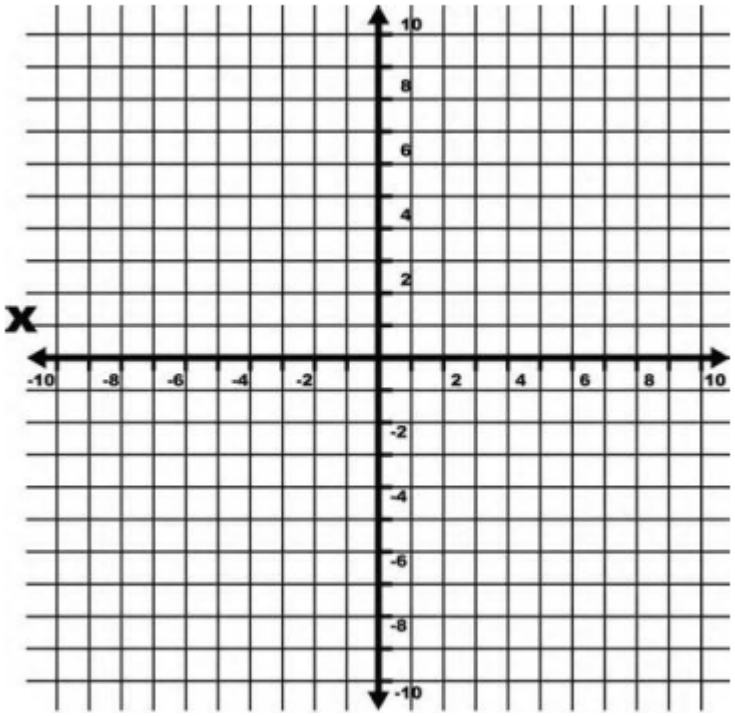
16. What does the '$k$' value represent in the vertex form of a quadratic function? How does the '$k$' value affect the parabola?

The '$k$' is the $y$-coordinate of the vertex. If $k$ is positive, the parabola moves up $k$ units. If $k$ is negative, the parabola moves down $k$ units.

**Complete the table for each quadratic function and graph the parabola.**

17. $y = x^2 - 2x - 3$ Vertex = (1, -4)

| $x$ | $y = x^2 - 2x - 3$ | $(x, y)$ |
|---|---|---|
| -1 | 1 + 2 – 3 = 0 | (-1, 0) |
| 0 | 0 – 0 – 3 = -3 | (0, -3) |
| 1 | 1 – 2 – 3 = -4 | (1, - 4) |
| 2 | 4 – 4 – 3 = -3 | (2, -3) |
| 3 | 9 – 6 – 3 = 0 | (3, 0) |




18. $y = (x + 2)^2 - 4$ Vertex = (-2, -4)

| $x$ | $y = (x + 2)^2 - 4$ | $(x, y)$ |
|---|---|---|
| -4 | 4 – 4 = 0 | (-4, 0) |
| -3 | 1 – 4 = -3 | (-3, -3) |
| -2 | 0 – 4 = -4 | (-2, -4) |
| -1 | 1 – 4 = -3 | (-1, -3) |
| 0 | 4 – 4 = 0 | (0, 0) |