

Quadratic Forms Maze

Name _____ Date _____ Hour _____

Algebra 2 ~ 2.1 Maze (BIM) Transformations of Quadratic Functions (TOR)

Essential Question: How do constants a , h & k impact quadratic function graph $g(x) = a(x-h)^2 + k$?

Goals 1) Describe transformations of quadratic functions, 2) Write transformations of quadratic functions, 3) apply

DIRECTIONS FOR SHOWING WORK: On the back, write each equation you have used and EXPLAIN how it is transformed and key features seen on graph. (ex: Vertex, Dilation, Axis of Symmetry, X-intercepts)

Transformation of Quadratic Function Maze

Directions: Write the quadratic function, that is obtained from the parent function $y = x^2$ modeling each graph. Use your solution to navigate through the maze. Show your work.

The maze consists of a grid of boxes. Each box contains a graph of a parabola and its equation. A yellow path starts at the 'START' point (marked with a star and circled 1) and winds through the maze, ending at a box with a star and the text 'Good Job!! The End'. Handwritten notes in blue and purple ink provide solutions for various boxes, including vertex coordinates and equations.

$(x-h)^2 + k$
 $(x-(-2))^2 + k$
 $x+2$

$y = x^2 - 6x + 11$
 $a = 1 \quad b = -6$
 $c = 11$
 $x = -\frac{(-6)}{2}$
 $x = \frac{6}{2} = 3$

Weeee!

① $y = -(x-3)^2 - 4$

- shift right 3 down 4
- Yes reflection $a = -1$
- No Dilation $|a| = 1$
- Vertex: $(3, -4)$
- Axis of sym. $x = 3$
- No x-intercepts

② $y = (x+2)^2 + 4$

- shifts left 2 up 4
- No Reflection $a = +1$
- No Dilation $|a| = 1$
- Vertex: $(-2, 4)$
- Axis of sym. $x = -2$
- No x-intercepts

③ $y = (x+1)^2 - 3$

- shift left 1 down 3
- Yes reflection $a = -1$
- No Dilation
- Vertex: $(-1, -3)$
- Axis of sym. $x = -1$
- No x-intercepts

④ $y = (x-1)^2 + 4$

Vertex: $(1, 4)$
A.O.S. $x = 1$

⑤ $y = -(x+1)^2 - 1$

- shift left 1 down 1
- Yes Reflection
- No Dil.
- Vertex: $(-1, -1)$
- A.O.S. $x = -1$
- No x-int.

⑥ $y = x^2 - 6x + 11$

A.O.S. $x = \frac{-(-6)}{2(1)} = \frac{6}{2} = 3$
Vertex: $(3)^2 - 6(3) + 11$
 $(3, 2)$

⑦ $y = -x^2 - 6x - 6$

- A.O.S. $x = \frac{-(-6)}{2(-1)} = \frac{6}{-2} = -3$
- Vertex: $(-3, 3)$
- shift left 3 up 3
- Reflected $a = -1$
- Y-int $(0, -6)$

⑧ $y = x^2 - 8x + 20$

- A.O.S. $x = \frac{-(-8)}{2(1)} = \frac{8}{2} = 4$
- Vertex: $(4, 4)$
- shift right 4 up 4
- No Reflection
- Y-int: $(0, 20)$

⑨ $y = -x^2 - 4x - 8$

- A.O.S. $x = \frac{-(-4)}{2(-1)} = \frac{4}{-2} = -2$
- Vertex: $(-2, -4)$
- shift left 2 down 4
- Reflected
- Y-int $(0, -8)$

⑩ $y = x(x-4)$

- x-intercepts: $x = 0, x = 4$
- Vertex: $(2, -4)$ • A.O.S. $x = 2$
- shift right 2 down 4
- No Reflection
- y-int $(0, 0)$

⑪ $y = x^2 + 2x + 2$

- A.O.S. $x = \frac{-(2)}{2(1)} = \frac{-2}{2} = -1$
- Vertex: $(-1, 1)$
- shift left 1 up 1
- y-int $(0, 2)$
- No Reflection or x-int

⑫ $y = -(x-4)^2 - 3$

- shift right 4 down 3
- Reflection $a = -1$
- Vertex: $(4, -3)$
- A.O.S. $x = 4$

⑬ $y = -x^2 + 8x - 14$

- A.O.S. $x = \frac{-(8)}{2(-1)} = \frac{-8}{-2} = 4$
- Vertex: $(4, 2)$
- shift right 4 up 2
- No reflection
- x-int between 2 and 3 and -2 and -1

⑭ $y = (x-2)(x-4)$

- x-int: $x = 2, x = 4$
- A.O.S. $x = 3$
- Vertex: $(3, -1)$
- shift right 3 down 1
- No reflection

⑮ $y = (x+2)^2 + 2$

- Vertex: $(-2, 2)$
- A.O.S. $x = -2$
- shift left 2, up 2
- No reflection or x-int.