

Name _____ Date _____

Vertex Form of the Quadratic Equation

$$y = a(x - h)^2 + k, \text{ with vertex at } (h, k)$$

- 1) Describe the transformation from $y = x^2$ to $y = (x - 3)^2 - 2$.

- 2) Describe the transformation from $y = (x + 2)^2 + 1$ to $y = (x - 2)^2 + 5$.

- 3) Describe the transformation from $y = (x - 2)^2$ to $y = x^2 - 4$.

Consider the leading coefficient “ a ” of $y = a(x - h)^2 + k$.

- 4) When “ a ” gets larger does the parabola stretch vertically (more narrow) or stretch horizontally (flatter)?

- 5) Describe the transformation of the parabola for $0 < a < 1$.

- 6) Describe the transformation of the parabola when “ a ” is a negative number.

Find the vertex. Is it a maxima or minima?

7) $y = x^2 - 5$

8) $y = (x + 3)^2$

9) $y = -2(x + 1)^2 + 7$

10) $y = x^2 - 2x + 3$

11) $y = -x^2 - 4x + 1$

12) $y = 3x^2 - 6x - 5$