

Introduction to Transformations

Date _____ Period _____

- 1) What is the name of the shape of the function $y = x^2$?
- 2) Describe the effect each part of the equation has on the shifts of the graph.
 $y = a(x - h)^2 + k$

a : _____

h : _____

k : _____

Without graphing, describe the transformations of each parabola.

3) $y = -2(x + 4)^2 + 3$

4) $y = \frac{1}{2}(x - 2)^2 + 4$

5) $y = (x - 2)^2 + 4$

6) $y = -\frac{1}{4}(x + 4)^2 + 2$

7) $y = -(x - 3)^2 - 4$

8) $y = -4(x - 1)^2 + 1$

9) $y = 3(x - 1)^2 + 4$

10) $y = -2(x + 2)^2 + 1$

Write an equation for the given information.

11) A quadratic equation that is shifted 4 units right and 3 units down.

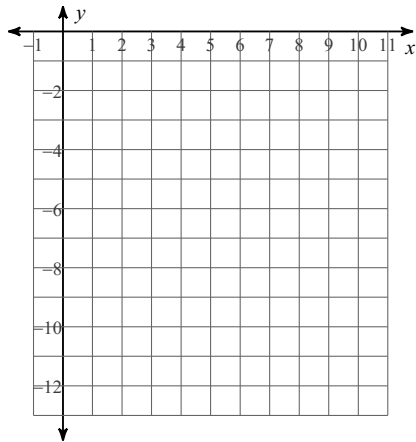
12) A quadratic equation that is reflected across the x -axis, transformed 4 units left and 1 unit up.

13) A quadratic equation that is stretched vertically by 2, transformed 3 units right and 4 units down.

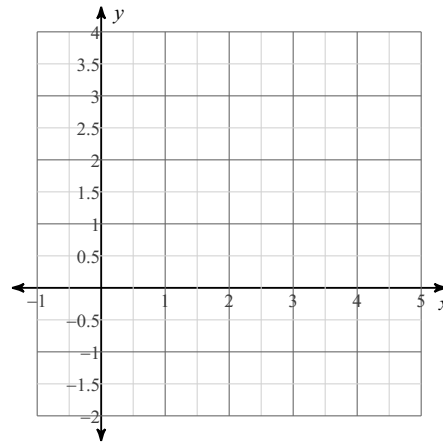
14) A quadratic equation that is compressed vertically by $\frac{1}{3}$, transformed 5 units left and 7 units up.

Graph each quadratic function. List the VERTEX, DOMAIN and RANGE.

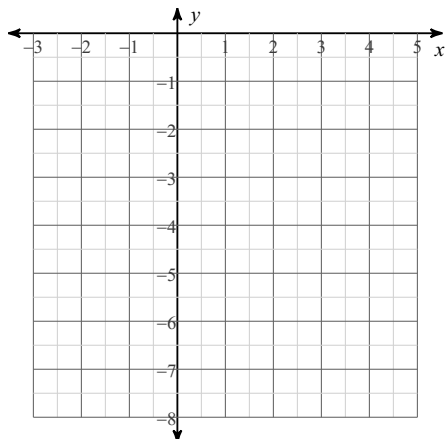
15) $y = -2(x - 3)^2 - 4$



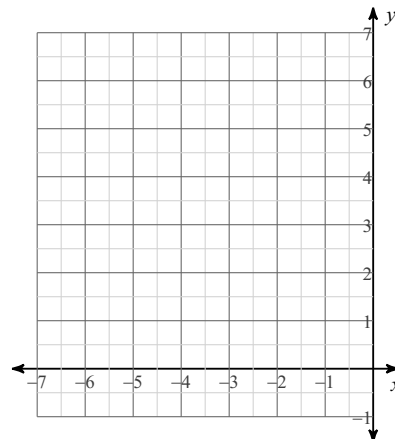
16) $y = -(x - 3)^2 + 3$



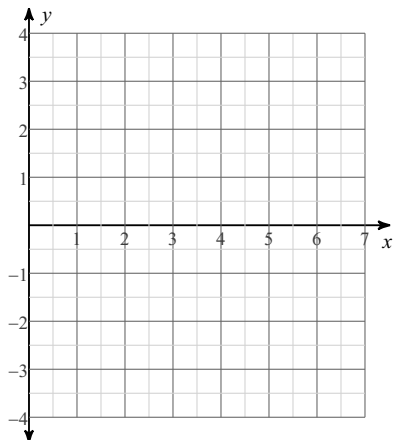
17) $y = -(x - 2)^2 - 3$



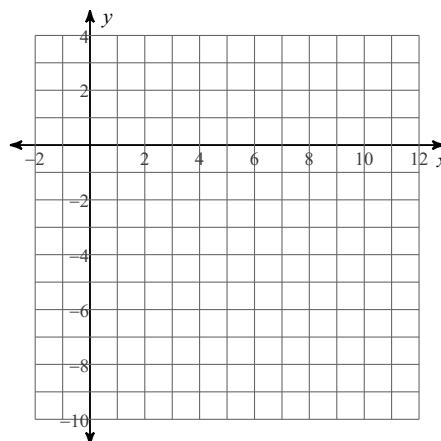
18) $y = (x + 4)^2 + 1$



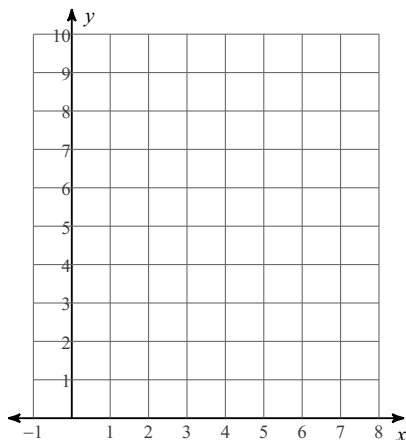
$$19) y = -\frac{1}{2}(x - 4)^2 + 1$$



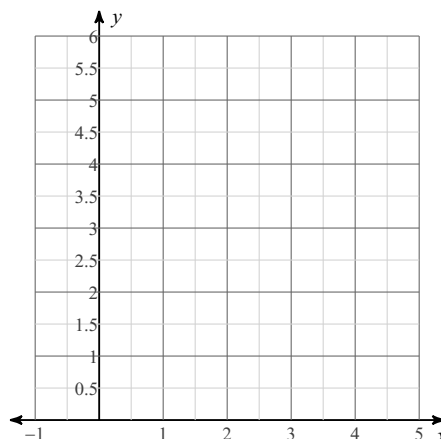
$$20) y = -3(x - 3)^2 + 3$$



$$21) y = 2(x - 4)^2 + 1$$



$$22) y = \frac{1}{2}(x - 2)^2 + 3$$



Factor each completely.

$$23) 9m^2 - 1$$

$$24) p^2 - 1$$

$$25) 6p^2 - 78p + 216$$

$$26) p^2 - 4p$$

$$27) 6k^2 - 96$$

$$28) p^3 - 11p^2 + 28p$$

Find the x-intercepts by factoring.

$$29) y = x^2 + x - 12$$

$$30) y = x^2 + 8x + 7$$