

## Day 2: Introduction to Transformations

Date \_\_\_\_\_

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1) Now that we are experts at graphing Quadratics, let's make some observations about the movement (also called \_\_\_\_\_) of ANY function.

The easiest form of a QUADRATIC to see the transformation(s) from is Vertex Form.

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

**Graph the following in your calculator.**

2)  $y = x^2$

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

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

What do you notice about the movement of the parabola?

3)  $y = x^2$

$$y = x^2 + 4$$

$$y = x^2 - 3$$

What do you notice this time about the movement of the parabola?

**Without graphing, list the transformations occurring in the function.**

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

5)  $y = (x + 8)^2 + 13$

6)  $y = (x + 5)^2 - 7$

7)  $y = (x - 12)^2 - 9$

**Graph the following equations in your calculator.**

8)  $y = x^2$

$$y = -x^2$$

What do you notice about the movement of the parabola?

9) Graph the following in your calculator:

$$y = x^2$$

$$y = 3x^2$$

$$y = \frac{1}{2}x^2$$

What is the transformation you notice?

**Let's Summarize:**

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

$a$ : \_\_\_\_\_

$h$ : \_\_\_\_\_

$k$ : \_\_\_\_\_

**Without graphing, describe the transformations of each parabola.**

11)  $y = -(x - 2)^2 + 2$

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

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

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

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

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

**Write an equation for the function described.**

17) A quadratic function that is transformed 3 units left and 4 units up.

18) A quadratic function that is reflected across the  $x$ -axis and transformed 2 units down.

19) A quadratic function that is reflected across the  $x$ -axis, stretched vertically by 2, transformed 1 unit right, and 3 units down.

20) A quadratic function that is compressed vertically by  $\frac{1}{4}$ , and transformed 2 units right.

**Domain and Range**

21) The next step to becoming expert at graphing functions is being able to state the DOMAIN and RANGE of each function.

DOMAIN is all possible \_\_\_\_\_

Domain is stated by reading the graph from \_\_\_\_\_ to \_\_\_\_\_

RANGE is all possible \_\_\_\_\_

Range is stated by reading the graph from \_\_\_\_\_ to \_\_\_\_\_

There are two ways to write the notation for Domain and Range.

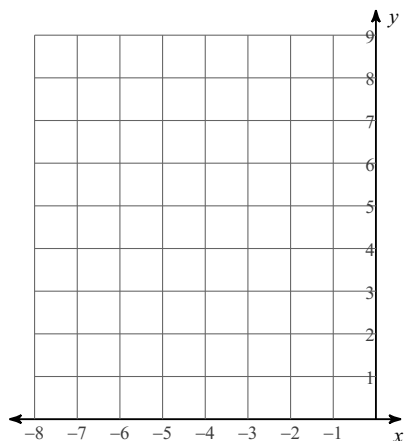
## INEQUALITY NOTATION

22) \_\_\_\_\_ or \_\_\_\_\_ means the graph is APPROACHING the value.

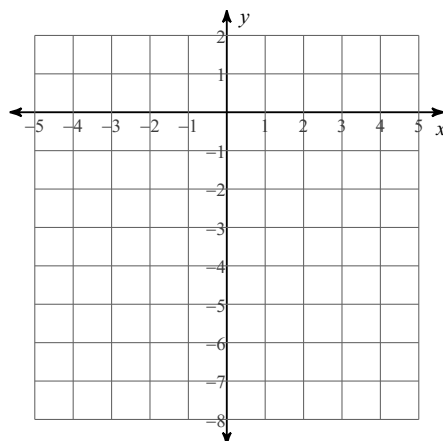
\_\_\_\_\_ or \_\_\_\_\_ means the graph is actually AT the value.

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

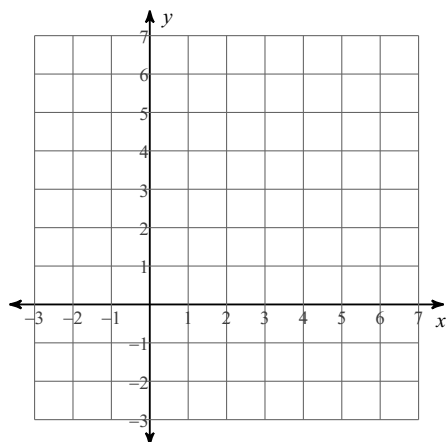
23)  $y = (x + 2)^2 + 4$



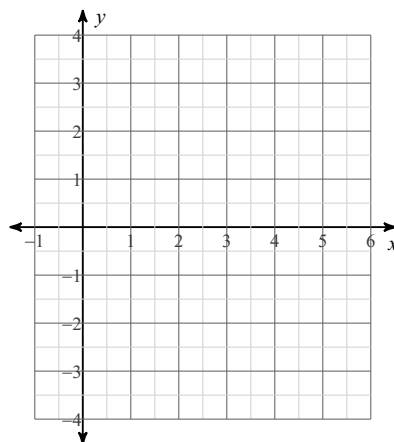
24)  $y = -2(x - 2)^2 + 1$



25)  $y = 2(x - 2)^2 - 2$



26)  $y = (x - 4)^2 - 2$



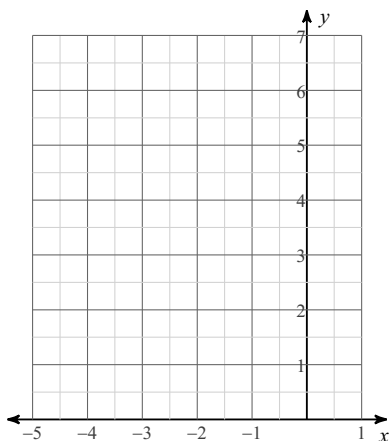
## INTERVAL NOTATION

27) \_\_\_\_\_ mean the graph is APPROACHING the value.

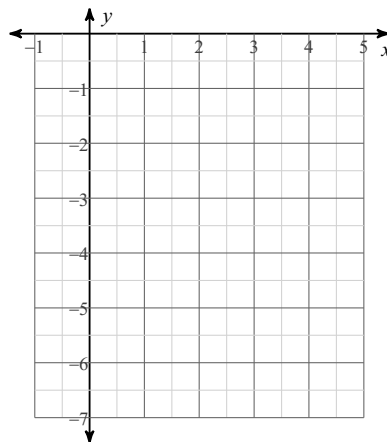
\_\_\_\_\_ means the graph is actually AT the value.  
\*\*\*Don't confuse these with ordered pairs.

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

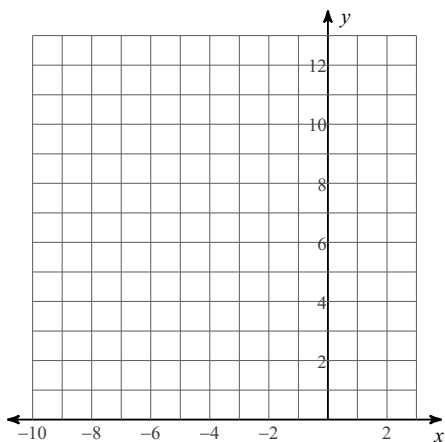
28)  $y = (x + 3)^2 + 2$



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



30)  $y = 2(x + 4)^2 + 4$



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

