

Read before you begin.

For this activity, you will need Desmos to do all the graphing:

DESMOS

After sketching each set of graphs on desmos, make sure to number your problems and write the equations on your graph paper and then write the coordinates of the locator points. Lastly comment about how the two graphs in each set are related (are they similar, same, reflected, shifted, stretched, etc.).

Note that when you see something of the form $y = \pm \text{equation}$, remember that you will need to split that into two equations, namely, $y = \text{equation}$ and $y = - \text{equation}$ and sketch them both.

1)(a) $x = y^2$ **(b)** $y = \pm \sqrt{x}$

2)(a) $x = (y - 1)^2$ **(b)** $y = 1 \pm \sqrt{x}$

3)(a) $x = 2(y + 1)^2 - 3$ **(b)** $y = -1 \pm \sqrt{(x + 3)/2}$

Now rewrite the following sleeping parabola equations in the $\pm$ format and sketch on graph paper:

$$x = 0.5(y + 1)^2 - 3$$

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

$$x = 2 - 0.5(y + 2)^2$$

Next rewrite the following sleeping parabolas equation in the $x = y^2$ format:

$$y = \pm 2\sqrt{x - 2} - 1$$

$$y = 1 \pm 0.5\sqrt{x + 3}$$

Can you rewrite this sleeping parabola in a different form:

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

Exponential Transformations Investigation. Using desmos, graph these

$$y = 2^x$$

$$y = 2^x + 1$$

$$y = 2^x + 2$$

$$y = 2^x - 1$$

$$y = 2^x - 2$$

$$y = -1 \cdot 2^x$$

$$y = -2 \cdot 2^x$$

$$y = -(0.5) \cdot 2^x$$

Given that the graphing form $y = a \cdot 2^x + k$, what do the a and k seem to do to the parent function?

Now without using desmos, sketch these equations:

$$y = 3 + 2 \cdot 2^x$$

$$y = 4 - (0.5) \cdot 2^x$$

$$y = -1 \pm 0.5\sqrt{x+1}$$

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