

# 6.6 Transformation Exploration



[https://commons.wikimedia.org/wiki/File:Christopher\\_Columbus3.jpg](https://commons.wikimedia.org/wiki/File:Christopher_Columbus3.jpg)

## A Solidify Understanding Task

In 6.5 *Let the Games Begin!* you were introduced to two new parent functions, the square root function  $y = \sqrt{x}$  and the inverse variation function  $y = \frac{1}{x}$ . Jeff was intrigued by your insights about transformations with these two functions and he wants to explore further. You will be given a set of cards with various graphs and equations of transformed functions. Your task is to match each graph with its equation and to group together cards that show similar transformations. What conclusions do you have to share with Jeff?

$$y = \frac{a}{x+h} + k$$

where "vertex" would be? → intersection of asymptotes

add slider for all

$a$  : 1) controls quadrants  $+$ : 1, 3  
 2) Distance of function from int. of asymptotes  $-$ : 2, 4

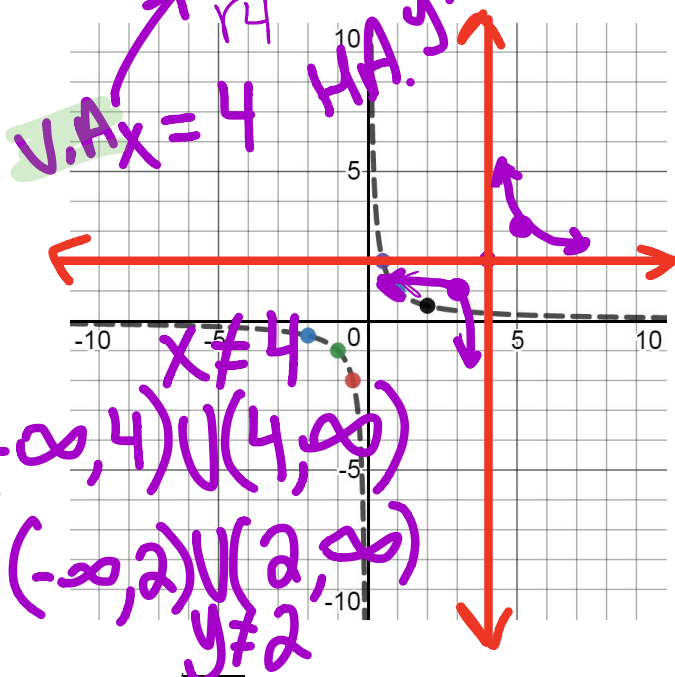
$k$  : changes vertically  
 horizontal asymptote

$h$  : changes horizontal  
 "vertical asymptote" opposite

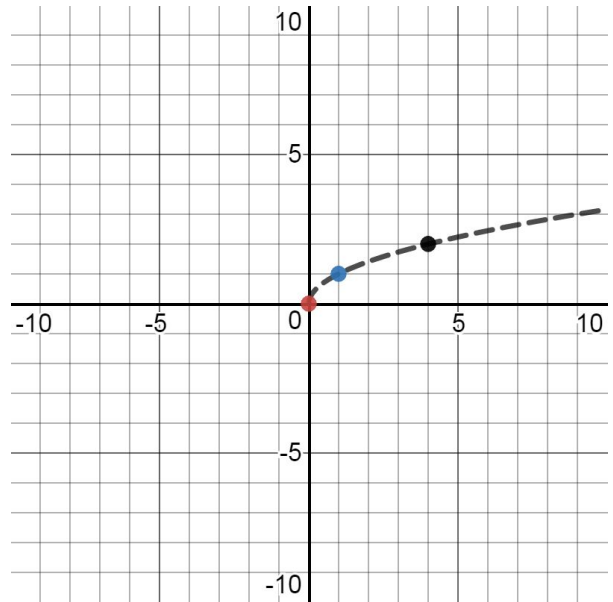
asymptote: a line that the graph will never touch or cross

Graph the following transformations. Be sure to show the key points of the transformed function. The parent function with key points has been provided for you.

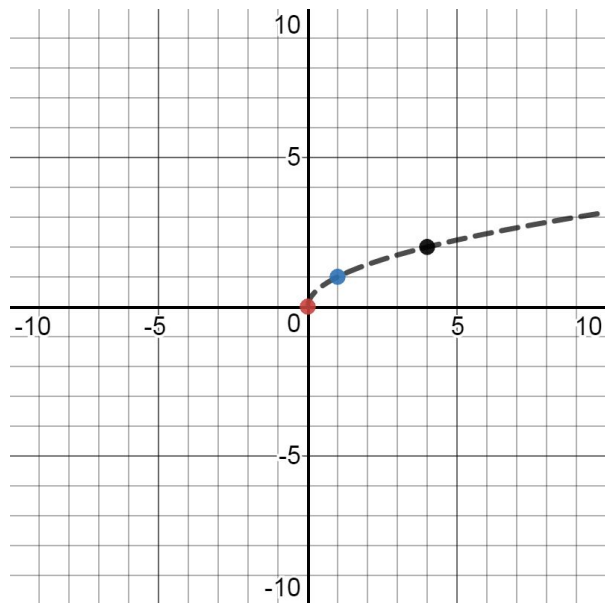
1.  $y = \sqrt{\frac{1}{(x-4)}} + 2$   $v_2 = 2$



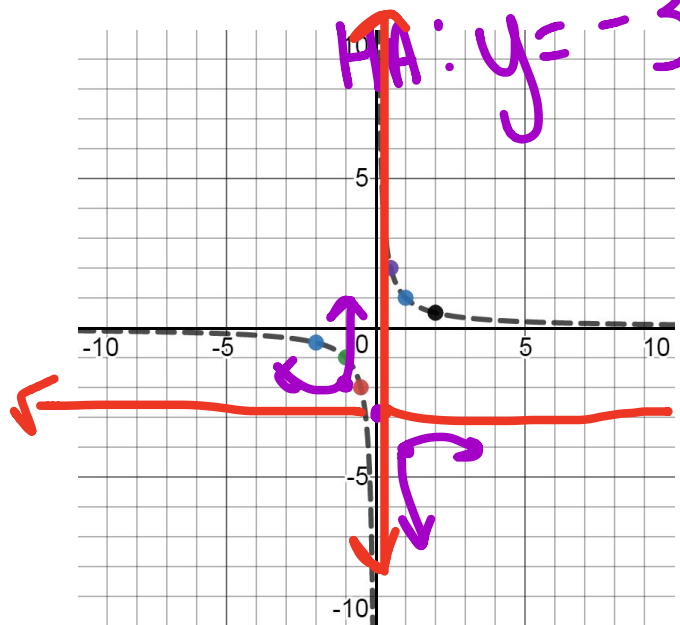
2.  $y = -\sqrt{x+5}$



3.  $y = \sqrt{x-2} - 6$



4.  $y = -\frac{1}{x-0} - 3$   $VA: x=0$   
 $HA: y=-3$



**READY, SET, GO!**

Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

**READY****Topic: Solving Systems of Linear and Quadratic Equations.**

Find any points of intersection for the two equations in each problem.

1. 
$$\begin{cases} y = x^2 + x - 2 \\ y = -x + 1 \end{cases}$$

2. 
$$\begin{cases} y + x = 5 \\ y = x^2 - 6x + 9 \end{cases}$$

3. 
$$\begin{cases} y = 3x + 4 \\ y = -x^2 \end{cases}$$

4. 
$$\begin{cases} y = x^2 + 11 \\ y = -12x \end{cases}$$

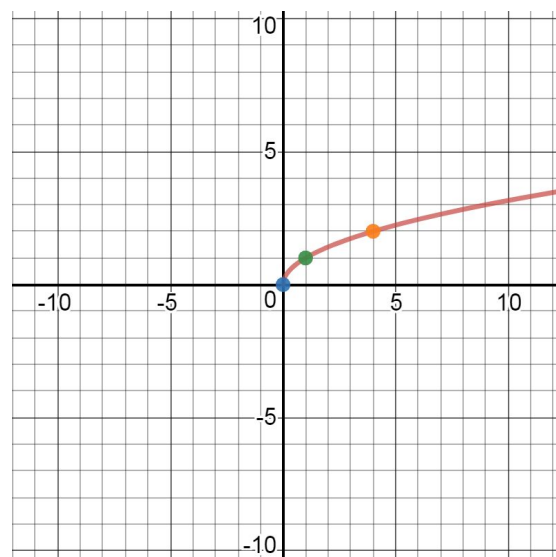
5. 
$$\begin{cases} y = 3x^2 + 21x - 5 \\ -10x + y = -1 \end{cases}$$

6. 
$$\begin{cases} y = x^2 - 11x - 20 \\ y = 25(4 - x) \end{cases}$$

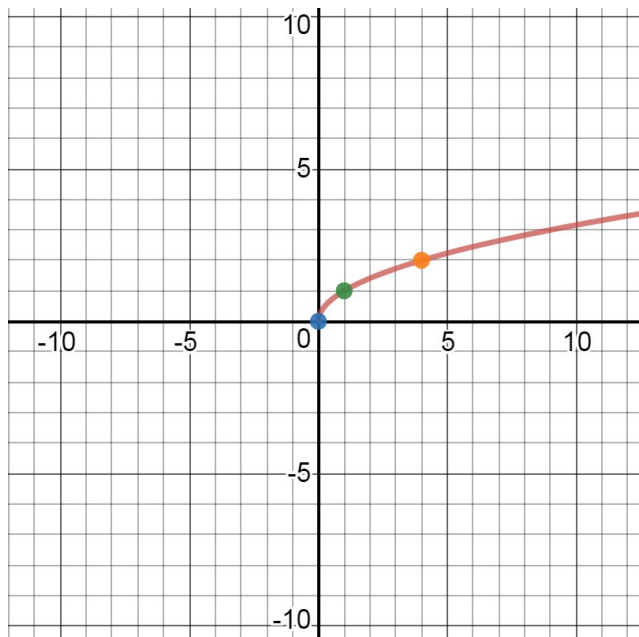
**SET****Topic: Graphing Transformations.**

Given the equation or description, graph the transformation of the parent function shown in each graph.

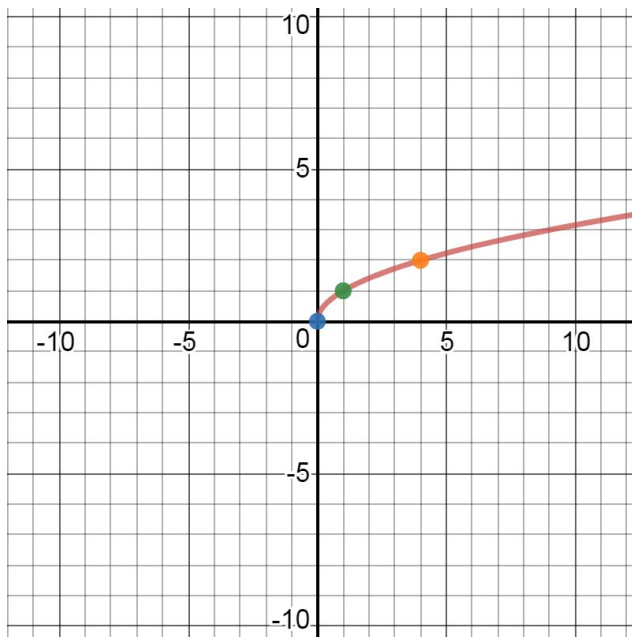
7. The graph has been reflected over the x-axis and shifted three units down, and two units right.



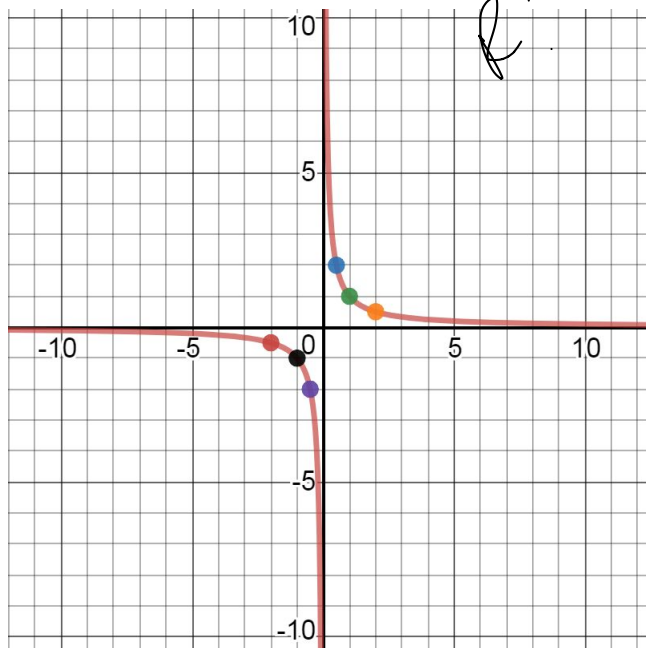
8. The graph has been stretched by a factor of 2, and shifted 5 units to the left.



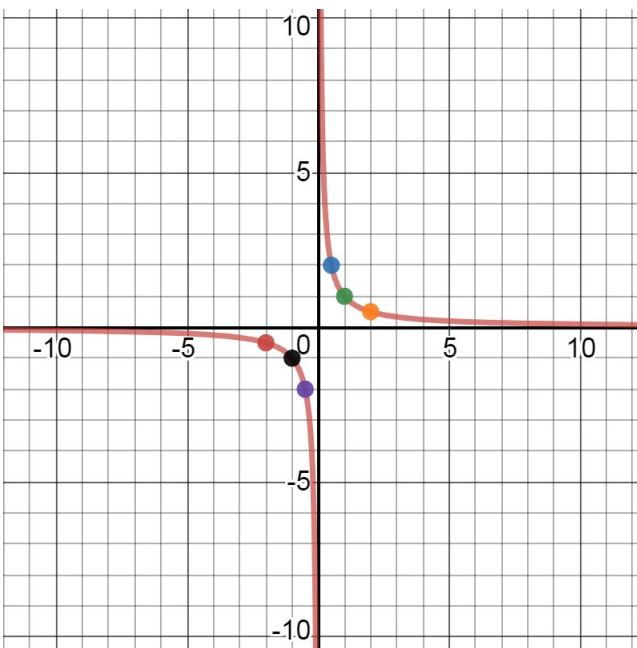
9.  $f(x) = -\sqrt{x} + 7$



10. The graph has shifted six units left, and two units down.



11.  $f(x) = \frac{9}{x} + 1$



**GO!****Topic: Identify the type of function.**

Each table is a model for a different type of function. Determine if each table is linear, exponential, quadratic, square root, or inverse variation.

12. 

x	f(x)
0	0.25
1	0.50
2	1
3	2
4	4

13. 

x	g(x)
1	5
5	1
10	$\frac{1}{2}$
15	$\frac{1}{3}$

14. 

x	h(x)
0	-2
1	2
2	8
3	16
4	26

15. 

x	m(x)
16	5
9	4
4	3
1	2

16. 

x	p(x)
-1	6
-2	10
-3	14
-4	18
-5	22

17. 

x	v(x)
1	12
2	6
3	4
4	3