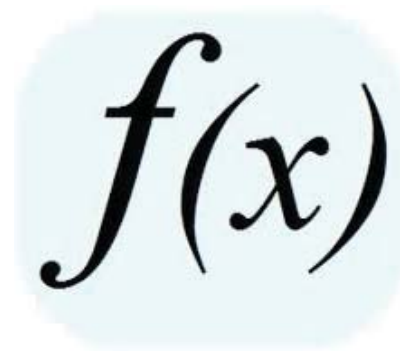


# Lesson 6! Let's Make a Function

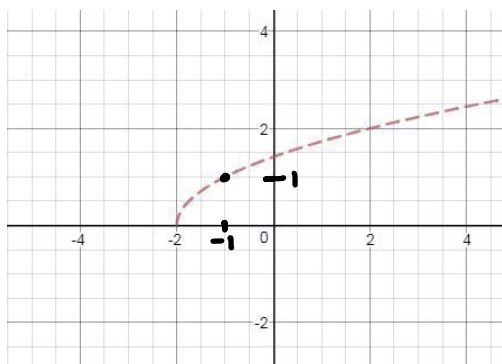
## A Practice Understanding Task

For this activity, you will be using what you have learned about radical functions and inverse variation functions and transformations to write the equation of a transformed function given a graph.

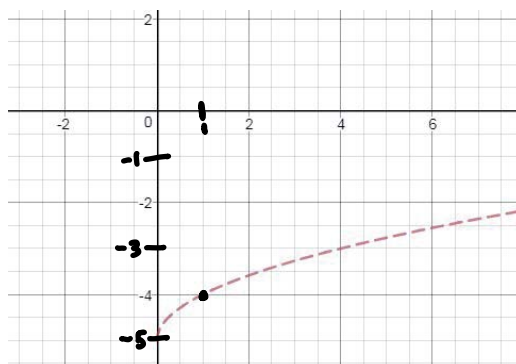


In the following graphs, a transformed function is represented with dashed lines. For each graph, determine whether the parent function is a square root function,  $y = \sqrt{x}$ , or an inverse variation function,  $y = \frac{1}{x}$ , and which transformation(s) have occurred. Then write the equation of the transformed function. (graphs created using Desmos)

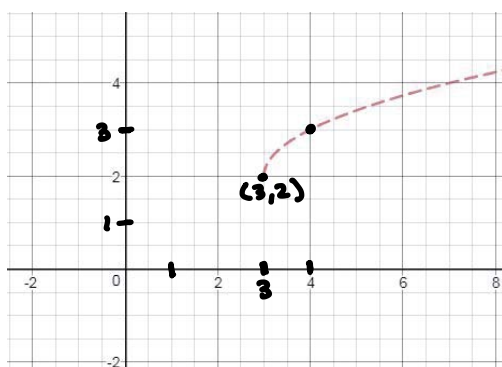
1.  $f(x) = \sqrt{x+2}$



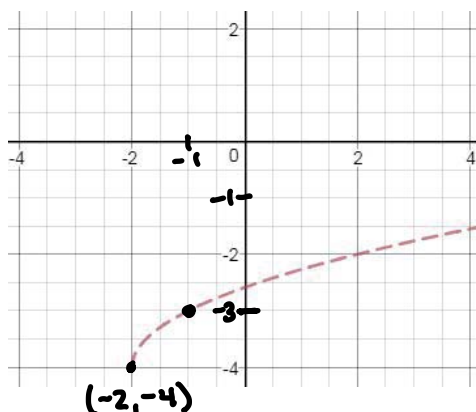
2.  $y = \sqrt{x} - 5$



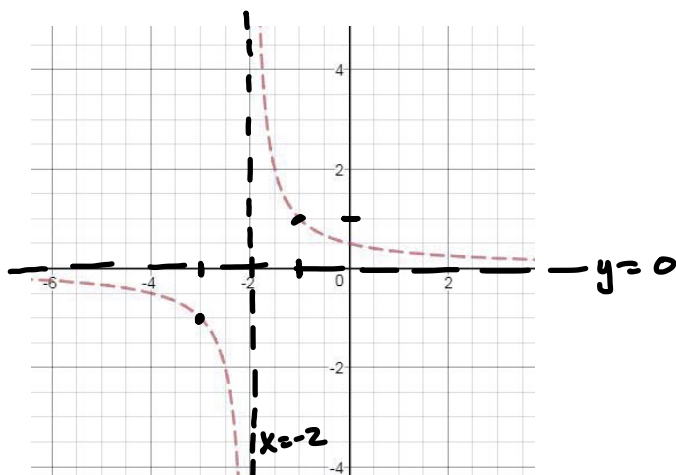
3.  $f(x) = \sqrt{x-3} + 2$



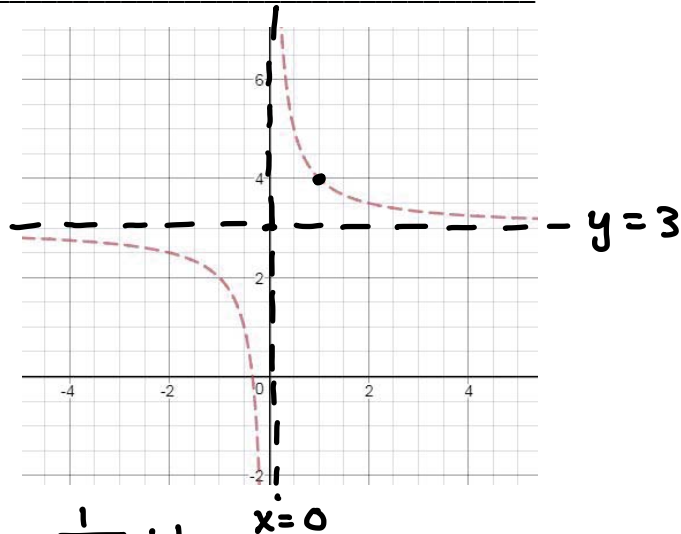
4.  $f(x) = \sqrt{x+2} - 4$



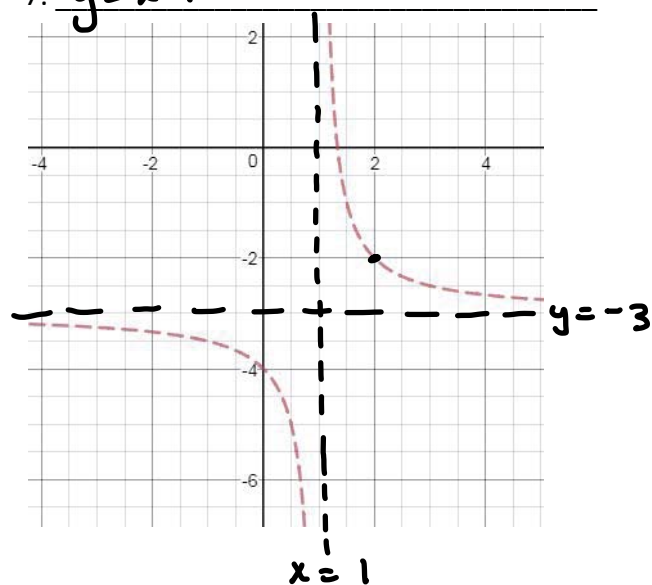
5.  $y = \frac{1}{x+2}$



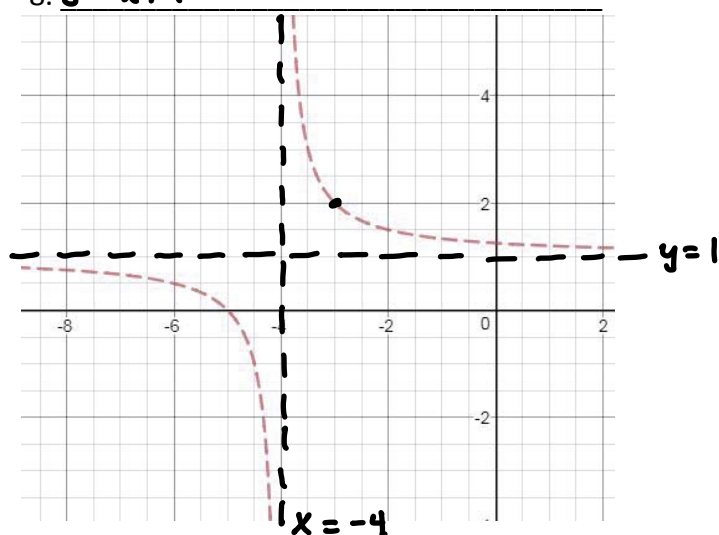
6.  $f(x) = \frac{1}{x} + 3$



7.  $y = \frac{1}{x-1} - 3$



8.  $y = \frac{1}{x+4} + 1$

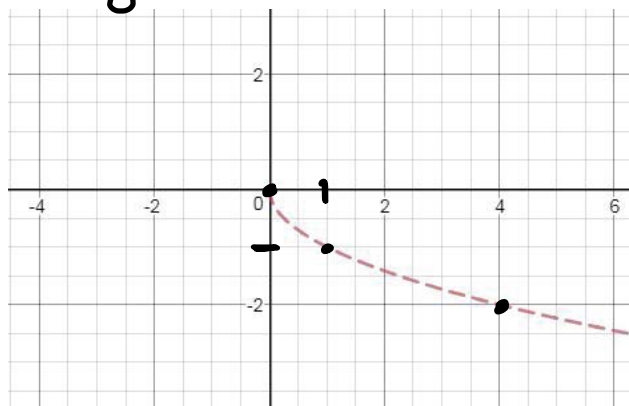


Which type of transformation occurred in problems 1-8?

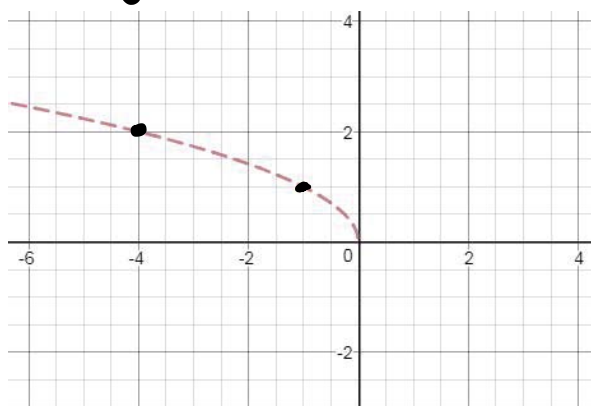
Translations

For the next few problems, a different type of transformation has been applied. You may also still see some of the previous type of transformation as well. Watch out as you write the equations!

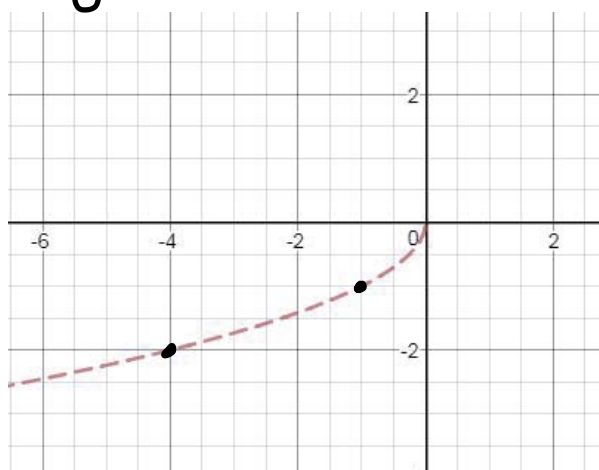
9.  $y = -\sqrt{x}$



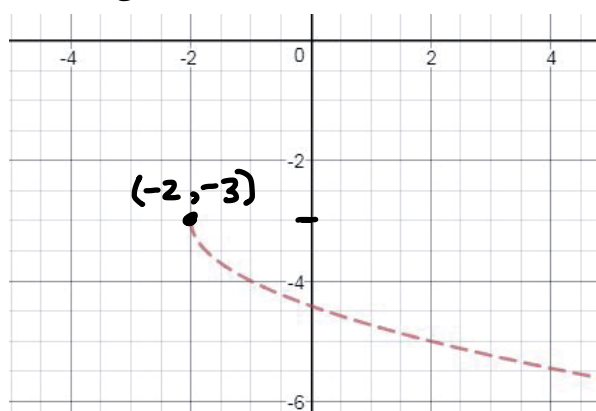
10.  $y = \sqrt{-x}$



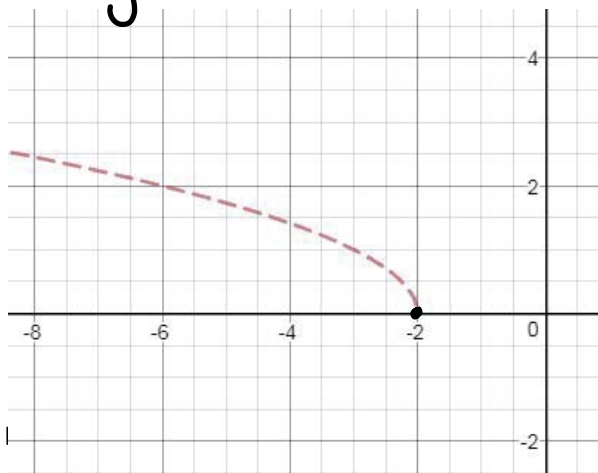
11.  $y = -\sqrt{-x}$



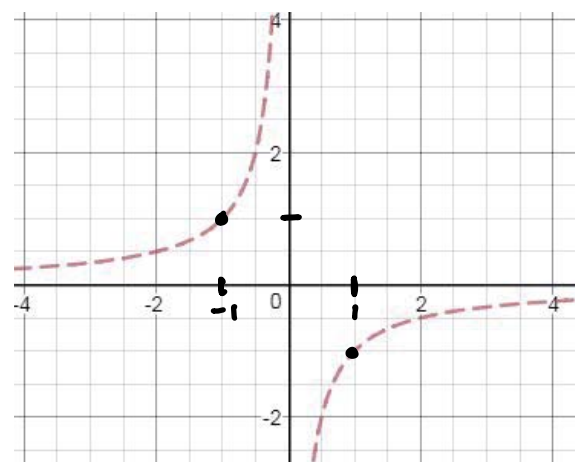
12.  $y = -\sqrt{x+2} - 3$



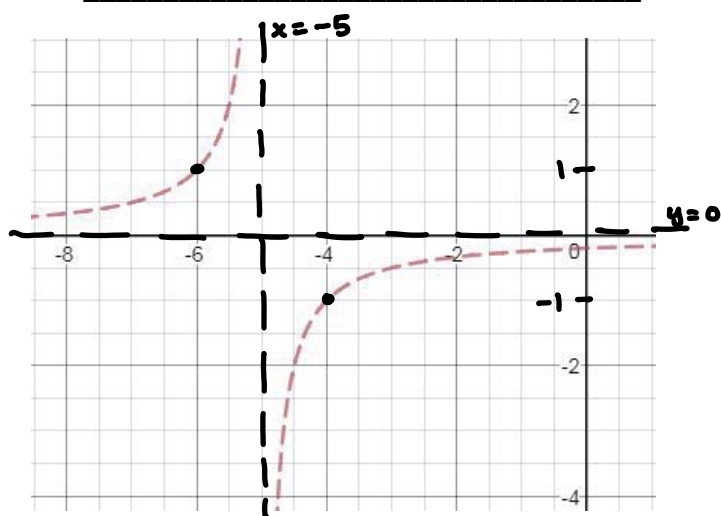
13.  $y = \sqrt{-(x+2)}$



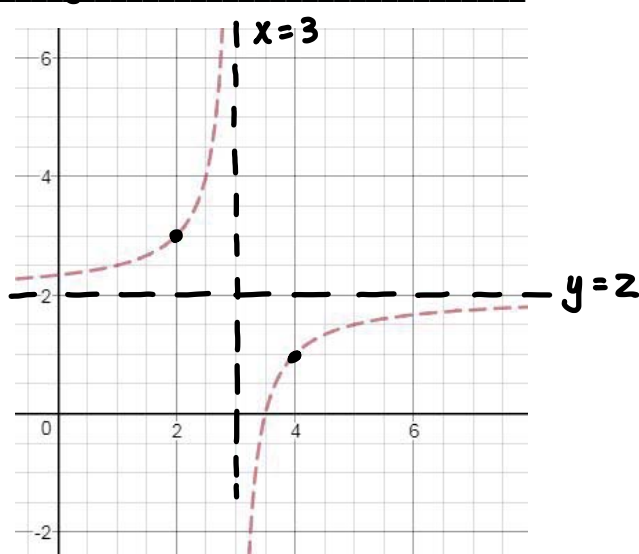
14.  $f(x) = -\frac{1}{x}$



15.  $y = -\frac{1}{x+5}$



16.  $y = -\frac{1}{x-3} + 2$

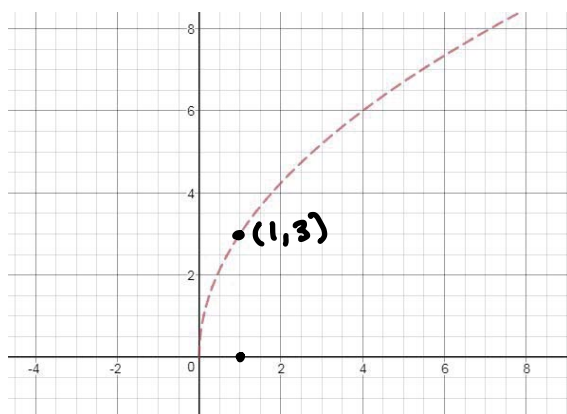


Which type of transformation was added in problems 9-16? How is this type of transformation different for radical functions as compared to inverse variation functions? Explain.

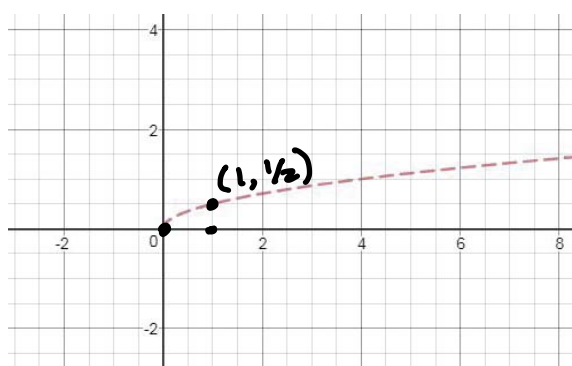
- reflection over x or y-axis
- transformation over x or y-axis has the same affect on the graph, which is not true for a square root function

For the next few problems, yet another type of transformation has been applied. You may also still see some of the previous types of transformations as well. Be careful!

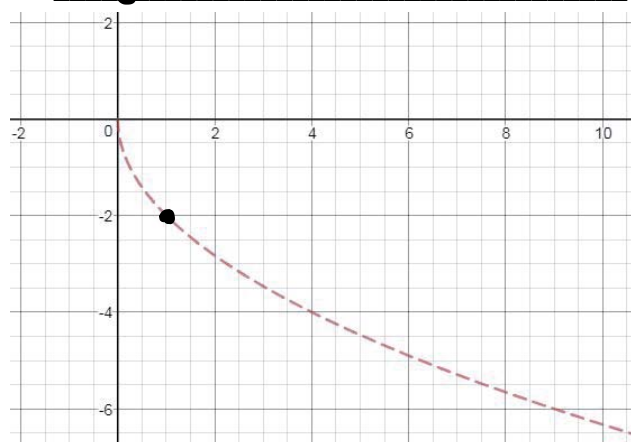
17.  $f(x) = 3\sqrt{x}$



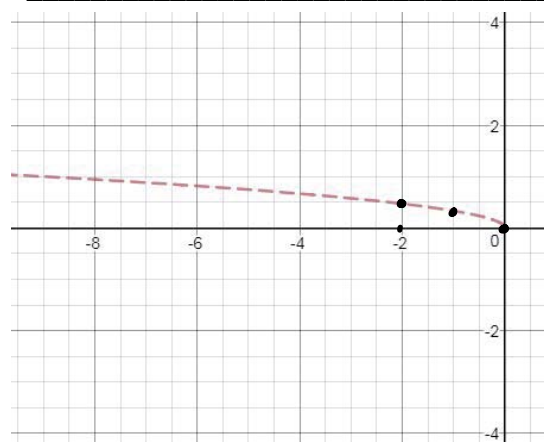
18.  $f(x) = \frac{1}{2}\sqrt{x}$



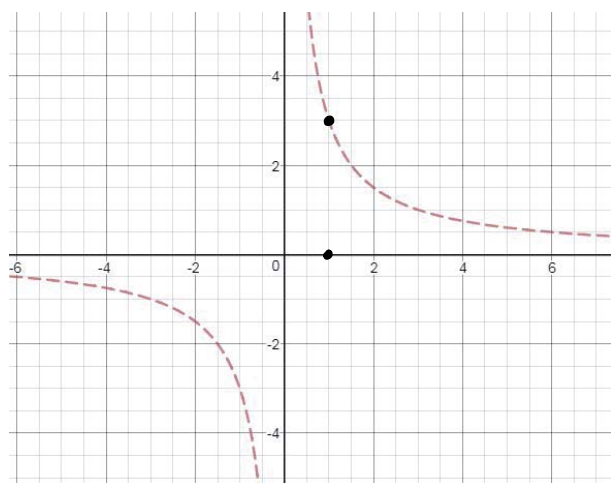
19.  $y = -2\sqrt{x}$



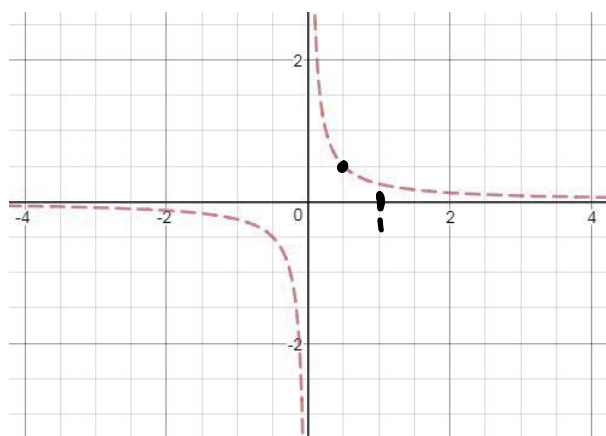
20. \_\_\_\_\_



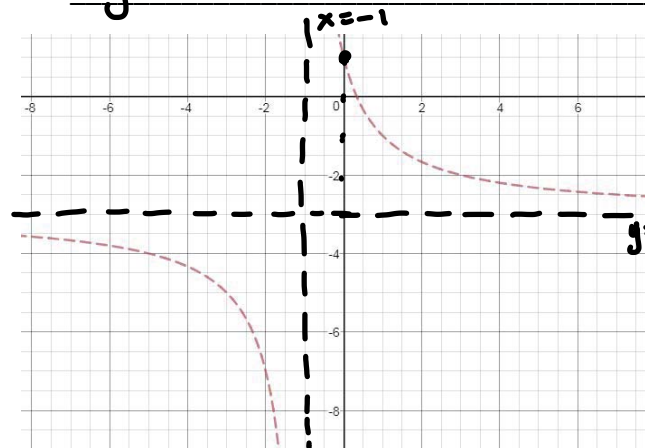
21.  $f(x) = \frac{3}{x}$



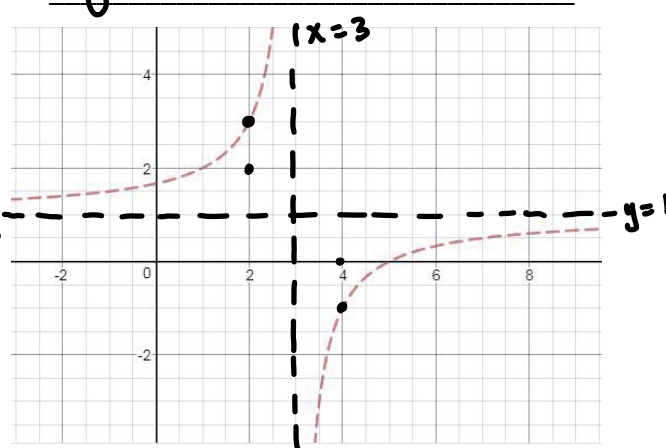
22.  $f(x) = \frac{1}{2} \cdot \frac{1}{x} = \frac{1}{2x}$



23.  $y = \frac{4}{x+1} - 3$



24.  $y = \frac{2}{x-3} + 1$



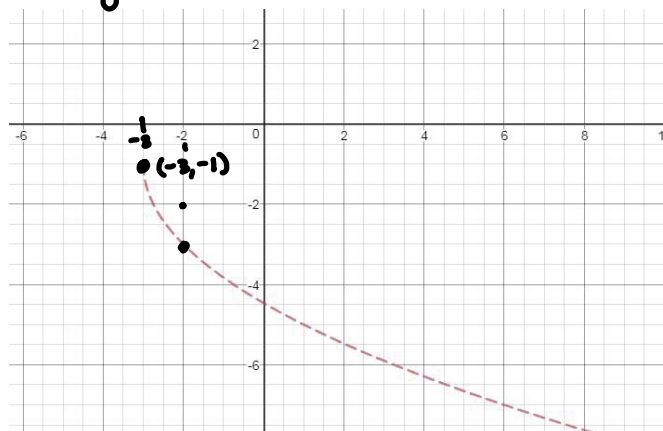
When applying a dilation to a function, the equation of the parent function is multiplied by a coefficient. Describe the effect different types of coefficients have on the shape of a function.

Vertical stretch  $|a| > 1$

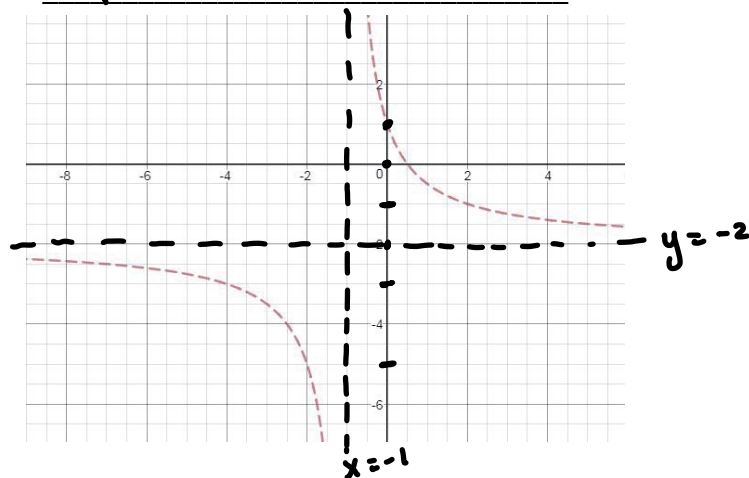
Vertical shrink  $|a| < 1$

For these last few problems, all types of transformations are combined. You can do this!

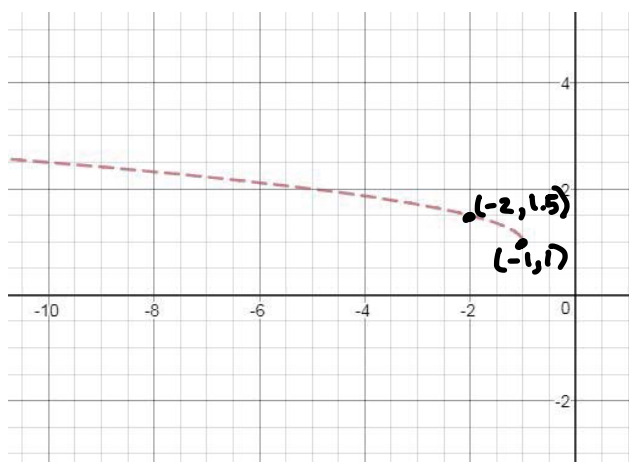
25.  $y = -2\sqrt{x+3} - 1$



26.  $f(x) = \frac{3}{x+1} - 2$



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



28.  $f(x) = -\frac{1}{2} \cdot \frac{1}{(x-4)} + 1 \rightarrow f(x) = -\frac{1}{2(x-4)} + 1$

