

$$y = \frac{a}{x}$$

a is pos:

Branches are in
Quadrants I and III

a is neg:

Branches are in
Quadrants II and IV

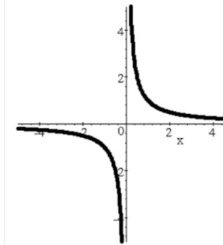
a is large:

Branches are
pushed further from
the origin

a is small:

Branches are
brought closer to
the origin

Asymptotes for the Reciprocal Function:



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

Horizontal Asymptote: the x-axis $y = 0$

Vertical Asymptote: the y-axis $x = 0$

Transformations of the Parent Function $y = \frac{1}{x}$

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

$$a > 0$$

Branches in
Quadrants
I and III

$$a < 0$$

Branches in
Quadrants
II and IV
(x-axis reflection)

$$h :$$

Horizontal
Translation
VA: $x = h$

$$k :$$

Vertical
Translation
HA: $y = k$

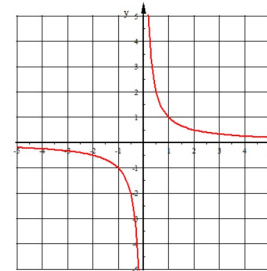
$$0 < a < 1$$

Vertical Shrink
Branches closer to the origin

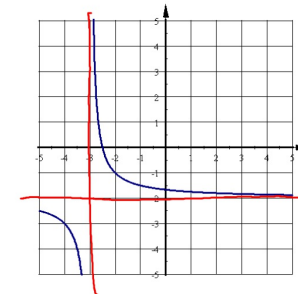
$$a > 1$$

Vertical Stretch
Branches further from origin

Parent Function: $y = \frac{1}{x}$

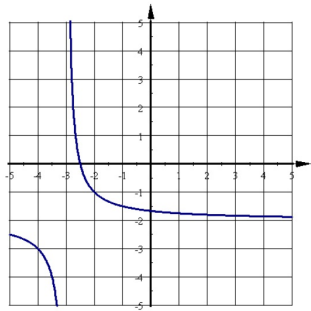


Describe the translations of the Parent Function that have created the graph shown below:



3 units left
and
2 units down

$y = \frac{1}{x}$ was translated
3 units left and 2 units down.



Write the equations of the asymptotes.

VA:

$$x = -3$$

HA:

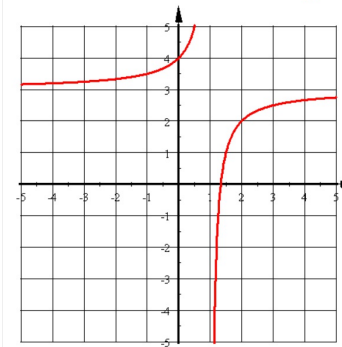
$$y = -2$$

Write the equation of this function

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

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

The function below is a
translation of $y = \frac{1}{x}$



Write the equations of the asymptotes.

VA:

$$x = 1$$

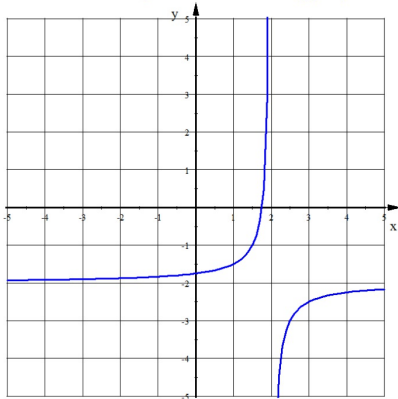
HA:

$$y = 3$$

Write the equation of this function

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

Write the equation of the graph below which is a transformation of $y = \frac{0.5}{x}$



VA:

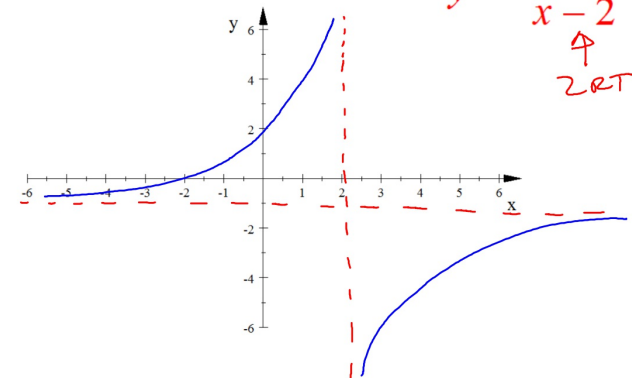
$$x = 2$$

HA:

$$y = -2$$

$$y = \frac{0.5}{x-2} - 2$$

Sketch the graph of this function:



$$y = \frac{-1}{x-2} - 1 \leftarrow 1 \text{ down}$$

2 RT

VA:

$$x = 2$$

HA:

$$y = -1$$

Sketch the graph of this function:

$$y = \frac{10}{x+2} + 2$$

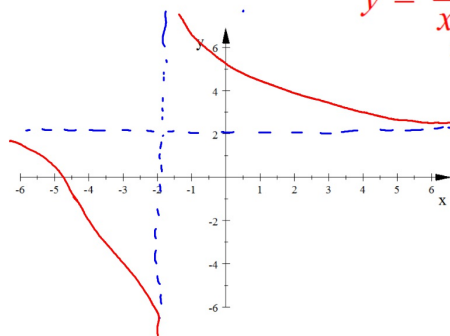
2 left 2 up

VA:

HA:

$$x = -2$$

$$y = 2$$



Sketch the graph of this function:

$$y = \frac{-0.1}{x+3} - 3$$

3 left 3 down

VA:

HA:

$$x = -3$$

$$y = -3$$

