

Name:

Date:

Period:

7.5 Graphing Reciprocal Functions Notes

Day 1 4/18

$$f(x) = \frac{1}{x}$$

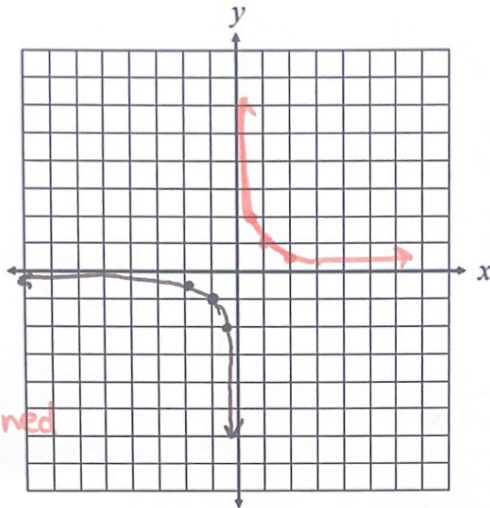
Reciprocal
PARENT FUNCTION

x	y
-2	-1/2
-1	-1
-1/2	-2
0	undefined
1/2	2
1	1

$$2 \mid \frac{1}{2}$$

$x=0$ is an
excluded
value

Standard
Form
OF A
RECIPROCAL FUNCTION



Type: reciprocal

Domain: $(-\infty, 0) \cup (0, \infty)$

Range: $(-\infty, 0) \cup (0, \infty)$

Vertical Asymptote: $x=0$

Horizontal Asymptote: $y=0$

$$f(-2) = \frac{1}{-2} = -\frac{1}{2}$$

$$f(-1) = \frac{1}{-1} = -1$$

$$f(-\frac{1}{2}) = \frac{1}{-\frac{1}{2}} = 1 \cdot -2 = -2$$

$$f(0) = \frac{1}{0} = \text{und.}$$

und.

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

$$f(1) = \frac{1}{1} = 1$$

$$f(2) = \frac{1}{2}$$

Transformations:

$$f(x) = \frac{a}{x-h} + k$$

• h is the horizontal shift. $= a \cdot \frac{1}{x-h} + k$

• k is the vertical shift.

• If a is negative, the function is reflected across x -axis

• If $|a| > 1$, the function is vertically stretched.

• If $0 < |a| < 1$, the function is vertically compressed.

Vertical Asymptote:

$$x = h$$

Horizontal Asymptote:

$$y = k$$

Writing
Reciprocal
Functions

Directions: Write each equation described. Identify the asymptotes.

1. The reciprocal parent function is reflected across the x-axis, then translated $\frac{4}{h}$ units right and $\frac{3}{k}$ units down.

$$f(x) = \frac{-1}{x-4} - 3$$

2. The reciprocal parent function is vertically stretched by a factor of $\frac{2}{a}$, then translated $\frac{7}{k}$ units up and $\frac{1}{h}$ unit left.

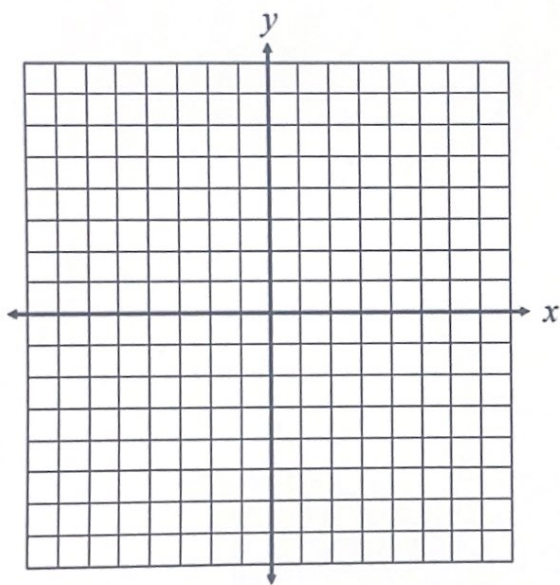
$$f(x) = \frac{2}{x+1} + 7$$

3. The reciprocal function has a vertical asymptote located at $x = -2$ and a horizontal asymptote at $y = 5$.

$$f(x) = \frac{1}{x+2} + 5$$

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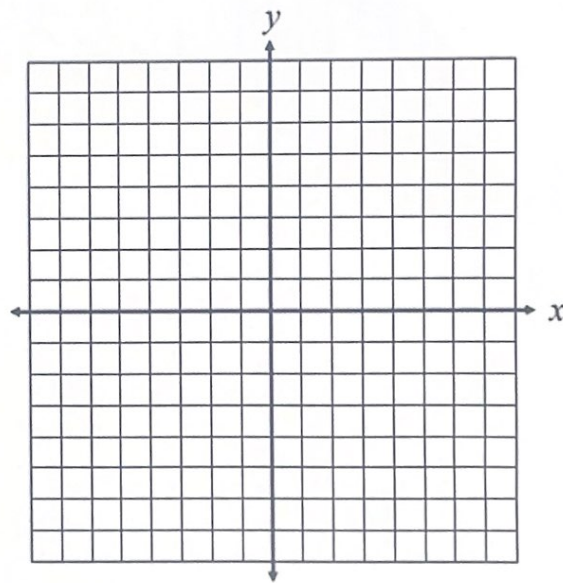
4. Graph $f(x) =$



Domain: _____ VA: _____

Range: _____ HA: _____

5. Graph $f(x) =$



Domain: _____ VA: _____

Range: _____ HA: _____