

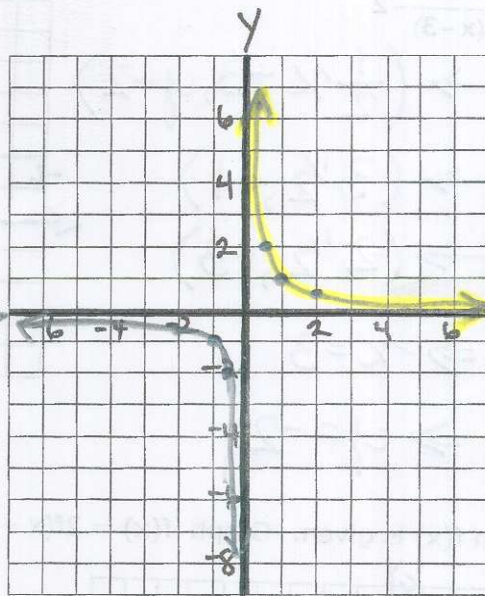
2.8 The Reciprocal Function

$g(x) = \frac{1}{x} = 0$

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

x	g(x)
200	.005
2	1/2
1	1
1/2	2

Same for negatives



asymptote -
-line that the graph approaches but never crosses

Always label asymptotes

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

(1, 1)

(-1, -1)

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

$$y = \frac{a}{b(x-h)} + k \quad (x, y) \rightarrow \left(\frac{1}{b}x + h, ay + k\right)$$

1. Sketch the graphs of the following functions

$$g(x) = \frac{1}{2(x-3)} - 2$$

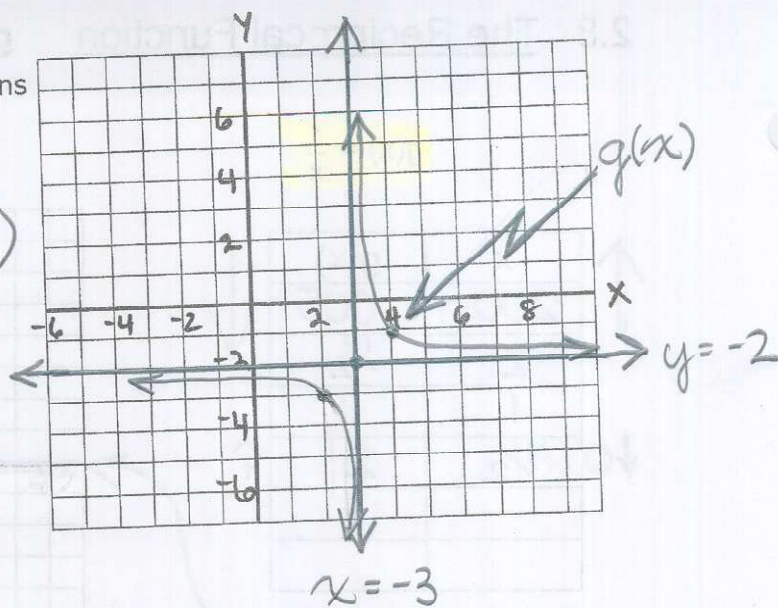
$$(x, y) \rightarrow \left(\frac{1}{2}x + 3, y - 2\right)$$

$$(1, 1) \rightarrow (3\frac{1}{2}, -1)$$

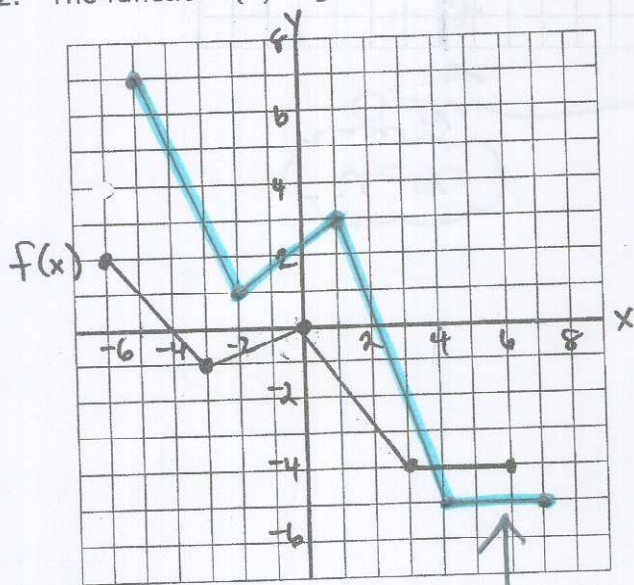
$$(-1, -1) \rightarrow (2\frac{1}{2}, -3)$$

$$v.a \Rightarrow x = 3$$

$$h.a \Rightarrow y = -2$$



2. The function $f(x)$ is given. Graph $f(x) = 2f(x-1) + 3$



$$(x, y) \rightarrow (x+1, 2y+3)$$

$$(-6, 2) \rightarrow (-5, 7)$$

$$(-3, -1) \rightarrow (-2, +1)$$

$$(0, 0) \rightarrow (1, 3)$$

$$(3, -4) \rightarrow (4, -5)$$

$$(6, -4) \rightarrow (7, -5)$$

$$f(x) = 2f(x-1) + 3$$

Homework:

Graph a) $f(x) = \frac{3}{x+1} + 3$

b) $g(x) = -\sqrt{2(x-1)}$

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

d) $h(x) = \frac{1}{2(x-2)} - 1$

e) $j(x) = \frac{1}{2}\sqrt{x+4} + 2$