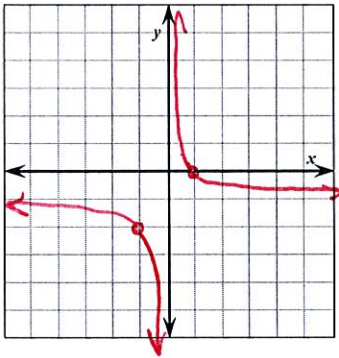


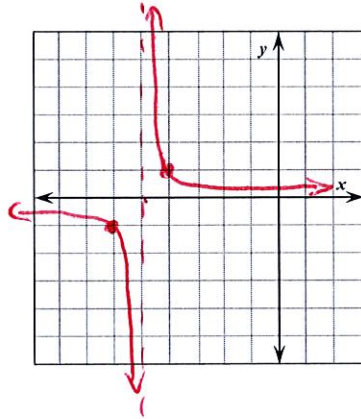
Rational Functions Day 2 Worksheet

1. Describe the transformations that have taken place when compared to a the parent graph of $f(x) = \frac{1}{x}$ then graph each one.

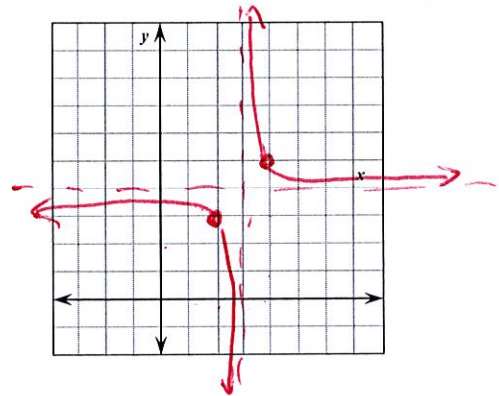
a. $f(x) = \frac{1}{x} - 1$



b. $g(x) = \frac{1}{x+5}$



c. $p(x) = \frac{1}{x-3} + 4$ $\frac{x-3}{x-3} = \frac{4x-11}{x-3}$



2. Create a function of the form $y = f(x)$ that satisfies each set of conditions.

- a. Vertical asymptotes at $x = 4$, hole at $x = 0$

$y = \frac{x(x-4)}{x-4}$

- b. Vertical asymptotes at $x = -5$ and $x = 1$, hole at $x = -1$

$y = \frac{x+1}{(x+5)(x-1)(x+1)}$

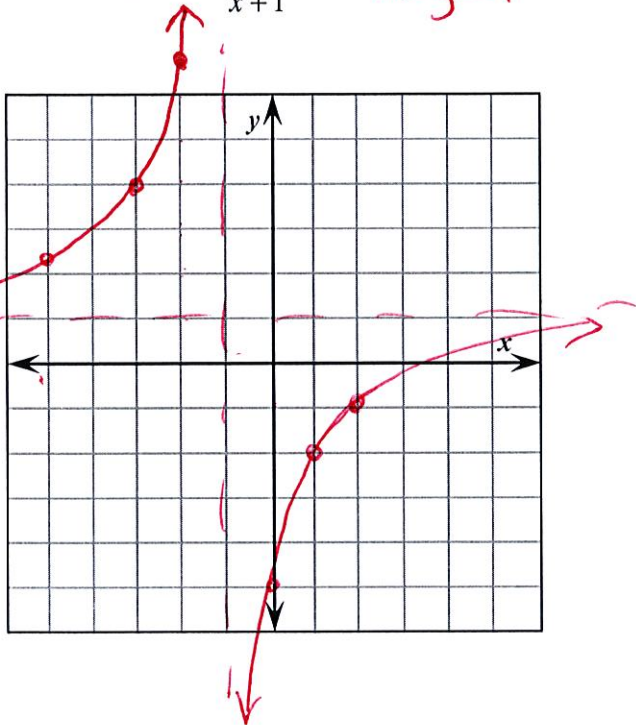
- c. Holes at $x = 3$ and $x = -7$, resembles $y = x$

$\frac{x(x-3)(x+7)}{(x-3)(x+7)}$

Graph each function.

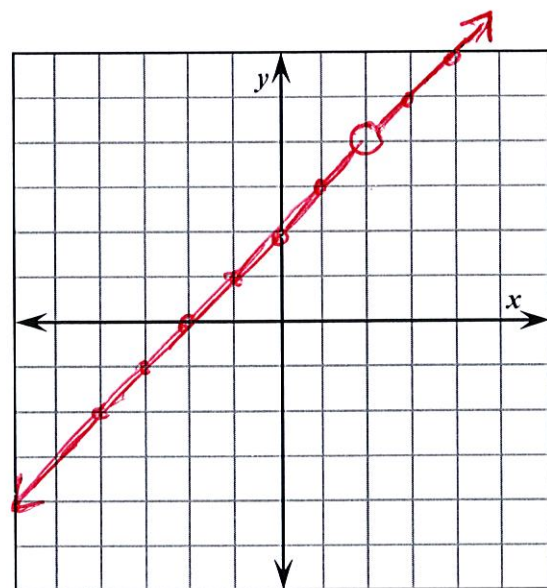
3. $g(x) = \frac{x-5}{x+1}$

VA: $x = -1$
HA: $y = 1$



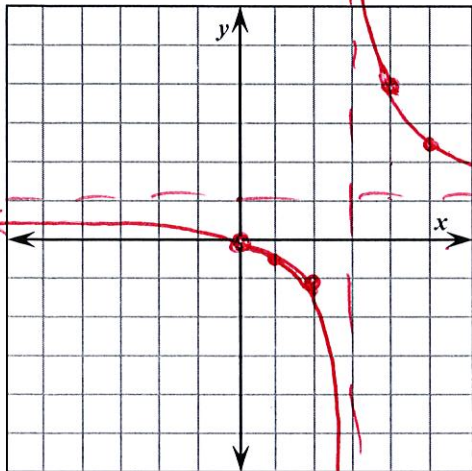
4. $g(x) = \frac{(x+2)(x-2)}{x-2}$

Hole (2, 4)



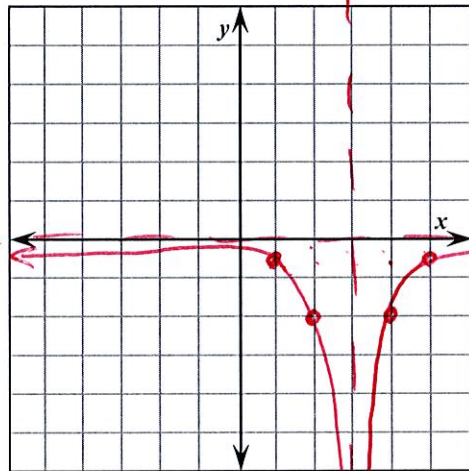
$$5. g(x) = \frac{x}{x-3}$$

VA: $x=3$
HA: $y=1$

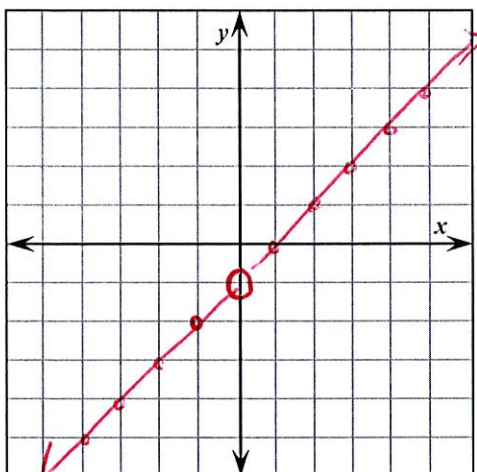


$$6. f(x) = \frac{-2}{(x-3)^2}$$

VA: $x=3$
HA: $y=0$

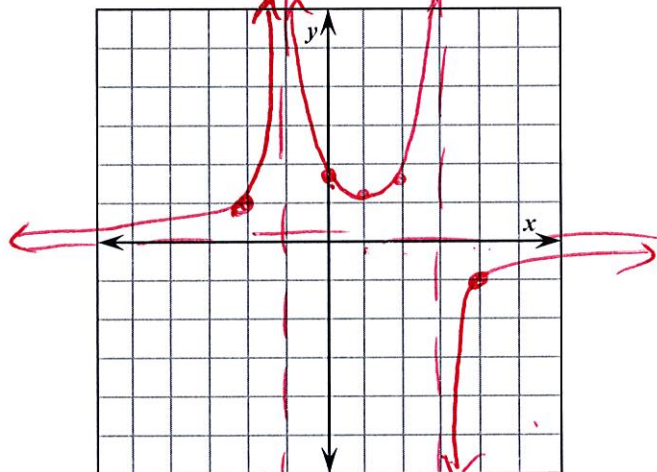


$$7. g(x) = \frac{x^2 - x}{x} = \frac{x(x-1)}{x} \quad \text{Hole } (0, -1)$$



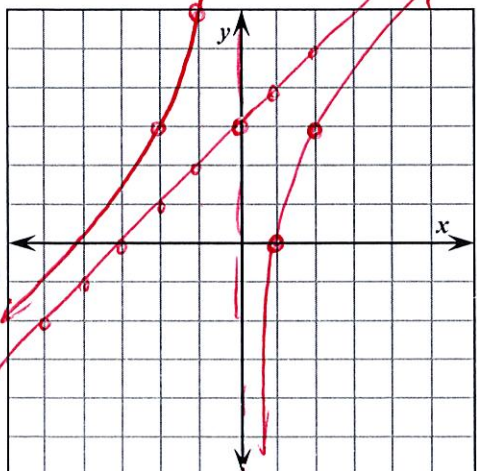
$$8. f(x) = \frac{-5}{(x-3)(x+1)}$$

VA: $x=3$ $x=-1$
HA: $y=0$



$$9. g(x) = \frac{x^2 + 3x - 4}{x}$$

VA: $x=0$
SA: $y=x+3$



x	y
1	0
2	3
-1	-4
-2	-4

$$10. f(x) = \frac{x}{1-x^2} = \frac{x}{(1+x)(1-x)} = \frac{x}{-x^2+1}$$

VA: $x=1$
 $x=-1$
HA: $y=-1$



x	y
0	0
1/2	1/4
-1/2	-1/4
2	2/3
-2	-2/3
-3	-3/8