

Name Ima Key

Date _____

Writing rational functions given characteristics:

1. V.A. - $x = \frac{2}{3}$ and $x = -1$
 $3x-2$ $x+1$

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

2. V.A. - $x = \frac{(x+1)}{-1}$ and $x = \frac{(2x-1)}{\frac{1}{2}}$
 H.A. - $y = 3$

$$f(x) = \frac{6x^2}{(x+1)(2x-1)}$$

3. H.A. - $y = 0$ and y-intercept $(0, 3)$

$\frac{3}{x+1}$, Bottom is Bigger

Holes: An open point on the graph, (x,y). X is found from what Cancels after factoring. Y is found by subbing x to the new equation.

ex: $\frac{x^2-9}{x+3} = \frac{(x+3)(x-3)}{(x+3)}$

$x = -3$

$y = -6$

hole = $(-3, -6)$

Domain: All Reals, except VA
 & x-value of holes.

Range: All Reals, except HA
 & y-values of Holes.

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

V.A.: $x = 3$

H.A.: $y = 1$

int(s): $(-2, 0)$

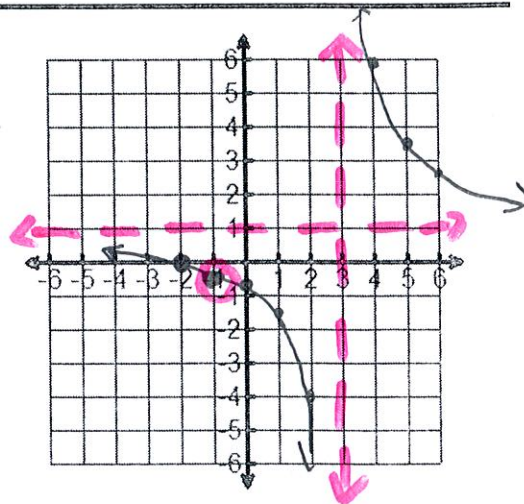
plug in y-int: $(0, -\frac{6}{7})$

Hole: $(-1, -\frac{1}{4})$

Domain: $\mathbb{R}, x \neq 3, -1$

Range: $\mathbb{R}, y \neq 1, -\frac{1}{4}$

x	y
-2	0
-1	$-\frac{1}{4}$
0	$-\frac{6}{7}$
1	-1.5
2	-4
4	6
5	3.5
6	2.6



5. $f(x) = \frac{x-1}{x^2+3x-4}$

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

V.A.: $x = -4$

Hole: $(1, \frac{1}{5})$

H.A.: $y = 0$

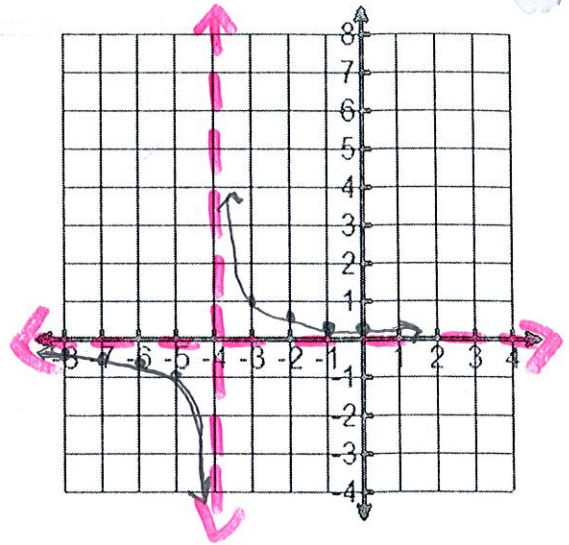
Domain: $\mathbb{R}, x \neq -4, 1$

x-int(s): NONE

y-int: $(0, \frac{1}{4})$

Range: $\mathbb{R}, y \neq 0, \frac{1}{5}$

x	y
-8	-0.25
-7	-0.33
-6	-0.50
-5	-1
-3	1
-2	0.5
-3	0.33



6. $f(x) = \frac{2x^2-18}{x^2-4} = \frac{2(x^2-9)}{(x-2)(x+2)} = \frac{2(x+3)(x-3)}{(x-2)(x+2)}$

V.A.: $x = 2, x = -2$

Hole: NONE

H.A.: $y = 2$

Domain: $\mathbb{R}, x \neq 2, -2$

x-int(s): $(-3, 0)(3, 0)$

y-int: $(0, 4.5)$

Range: $(-\infty, 2) \cup [4.5, \infty)$

x	y
-5	1.5
-4	1.16
-3	0
-1	5.3
0	4.5
1	5.3
3	0
4	1.16
5	1.5

