

Activity 21

Name: _____

QUIZ REV.

A	B	C	D	E	F
$\frac{x-4}{2}$	$\frac{3}{x-1}$	$\frac{2}{x}$	$\frac{x}{2(x+1)}$	$\frac{x-4}{2}$	$\frac{3}{x-1}$
$\frac{x-3}{x+3}$	$\frac{1}{2}$	$\frac{x+4}{2(x-4)}$	$\frac{x}{2}$	$\frac{1}{x+5}$	$\frac{1}{2}$
$\frac{1}{x+3}$	$\frac{x+3}{x+1}$	$\frac{x+5}{x-5}$	$\frac{x+1}{2(x-1)}$	$\frac{1}{x+3}$	$\frac{x+3}{x+1}$
$\frac{1}{x+3}$	$\frac{x+3}{x+1}$	$\frac{x-2}{x-1}$	$\frac{1}{x+1}$	$\frac{1}{x+3}$	$\frac{x+3}{x+1}$
$\frac{x-4}{2}$	$\frac{3}{x-1}$	$\frac{2}{x}$	$\frac{x}{2(x+1)}$	$\frac{x-4}{2}$	$\frac{3}{x-1}$
$\frac{1}{x+5}$	$\frac{1}{2}$	$\frac{x+4}{2(x-4)}$	$\frac{x}{2}$	$\frac{x-3}{x+3}$	$\frac{1}{2}$

Simplify each expression.



$$\frac{x-2}{x^2+x-6} = \frac{1}{x+3}$$



$$\frac{x^2+4x}{2x^2-8x} = \frac{x(x+4)}{2x(x-4)} = \frac{x+4}{2(x-4)}$$



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



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



$$\frac{x^2+x-6}{x^2-x-2} = \frac{(x-2)(x+3)}{(x+1)(x-2)} = \frac{x+3}{x+1}$$



$$\frac{2x^2-4x-6}{4x^2-16x+12} = \frac{2(x^2-2x-3)}{4(x^2-4x+3)} = \frac{2(x+1)(x-3)}{2 \cdot 4(x-1)(x-3)} = \frac{x+1}{2(x-1)}$$



$$\frac{x^2-16}{2x+8} = \frac{(x+4)(x-4)}{2(x+4)} = \frac{x-4}{2}$$



$$\frac{2x^2-10x}{4x^2-16x-20} = \frac{2x(x-5)}{2 \cdot 4(x^2-4x-5)} = \frac{x}{2(x+1)}$$



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



$$\frac{x^2+6x+5}{x^2-4x-5} = \frac{(x+1)(x+5)}{(x+1)(x-5)}$$



$$\frac{5x^2+x}{10x^2+2x} = \frac{x(5x+1)}{2x(5x+1)} = \frac{1}{2}$$



$$\frac{8x-4}{4x^2-2x} = \frac{4(2x-1)}{2x(2x-1)} = \frac{2}{x}$$



$$\frac{x-5}{x^2-25} = \frac{1}{x+5}$$



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



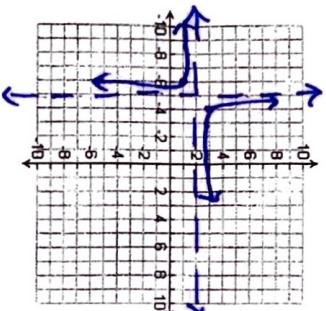
$$\frac{6x-5x^2+x^3}{2x^2-10x+12} = \frac{x(x^2-5x+6)}{2(x^2-5x+6)} = \frac{x}{2}$$

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Extra Practice Graphing Rational Functions

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

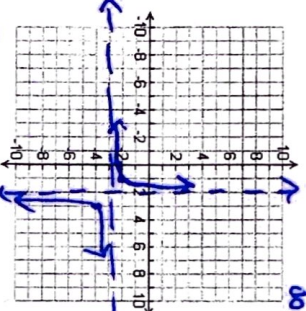
Translations Needed to Graph:



left 5
up 2
VA $x = -5$
HA $y = 2$
As $x \rightarrow \infty$
 $y \rightarrow 2$
As $x \rightarrow -\infty$
 $y \rightarrow 2$
Domain: $\{x | x \neq -5\}$

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

Translations Needed to Graph:

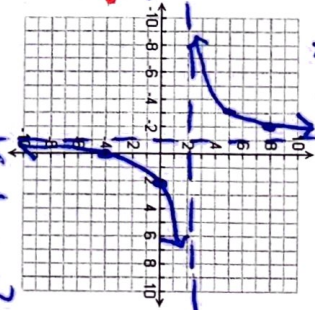


reflect x -axis
right 2
down 3
VA $x = 2$
HA $y = -3$
As $x \rightarrow \infty$
 $y \rightarrow -3$
As $x \rightarrow -\infty$
 $y \rightarrow -3$
Domain: $\{x | x \neq 2\}$

Extra Practice Graphing Rational Functions

5) $y = \frac{2x-4}{x+1}$

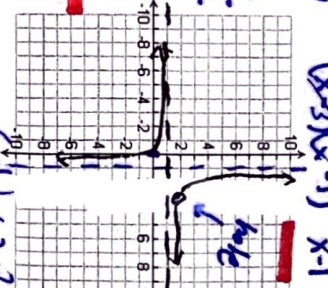
VA $x+1=0$
 $x=-1$



VA $x+1=0$
 $x=-1$
HA $y = \frac{2x-4}{x+1} = 2$
R: $x-2=0 \Rightarrow x=2$
Hole $(2, 2)$
num = 0
denom = 0
VA $x = -1$
HA $y = 2$
Roots $(2, 0)$
As $x \rightarrow \infty$, $y \rightarrow 2$
As $x \rightarrow -\infty$, $y \rightarrow 2$
Domain: $\{x | x \neq -1\}$

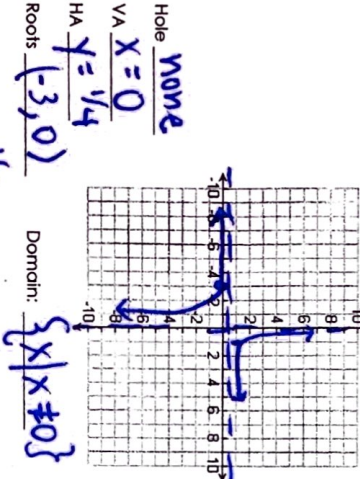
6) $f(x) = \frac{1}{x^2-4x+3} = \frac{x(x-3)}{(x-3)(x-1)} = \frac{x}{x-1}$

Hole: $x-3=0$
 $x=3$



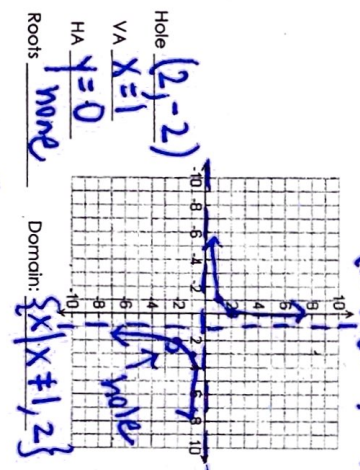
$y = \frac{3}{3-1} = \frac{3}{2}$
VA $x-1=0$
 $x=1$
Hole $(3, 3/2)$
VA $x=1$
HA $y=1$
Roots $(0, 0)$
As $x \rightarrow \infty$, $y \rightarrow 1$
As $x \rightarrow -\infty$, $y \rightarrow 1$
Domain: $\{x | x \neq 1\}$

3) $y = \frac{x+3}{4x}$



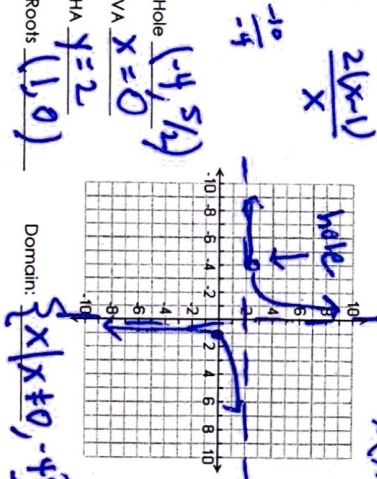
Hole $(-3, 0)$
VA $x=0$
HA $y = 1/4$
Roots $(-3, 0)$
Domain: $\{x | x \neq 0\}$
As $x \rightarrow \infty$, $y \rightarrow 1/4$
As $x \rightarrow -\infty$, $y \rightarrow 1/4$

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



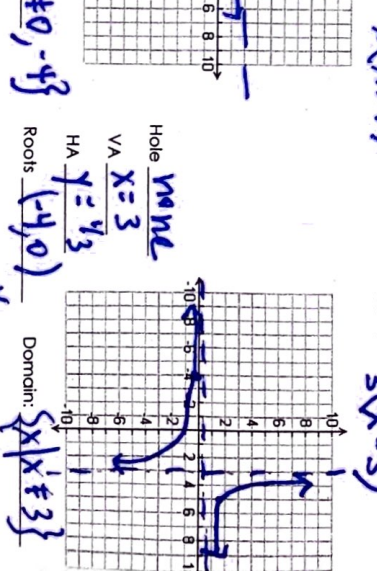
Hole $(2, 2)$
VA $x=1$
HA $y=0$
Roots $(1, 0)$
Domain: $\{x | x \neq 1, 2\}$
As $x \rightarrow \infty$, $y \rightarrow 0$
As $x \rightarrow -\infty$, $y \rightarrow 0$

7) $y = \frac{2x^2+6x-8}{x^2+4x}$



Hole $(-4, 5/2)$
VA $x=0$
HA $y=2$
Roots $(1, 0)$
Domain: $\{x | x \neq 0, -4\}$
As $x \rightarrow \infty$, $y \rightarrow 2$
As $x \rightarrow -\infty$, $y \rightarrow 2$

8) $f(x) = \frac{x+4}{3x-9} = \frac{x+4}{3(x-3)}$



Hole $(-4, 0)$
VA $x=3$
HA $y = 1/3$
Roots $(-4, 0)$
Domain: $\{x | x \neq 3\}$
As $x \rightarrow \infty$, $y \rightarrow 1/3$
As $x \rightarrow -\infty$, $y \rightarrow 1/3$