

Key

Name : _____

Date: _____

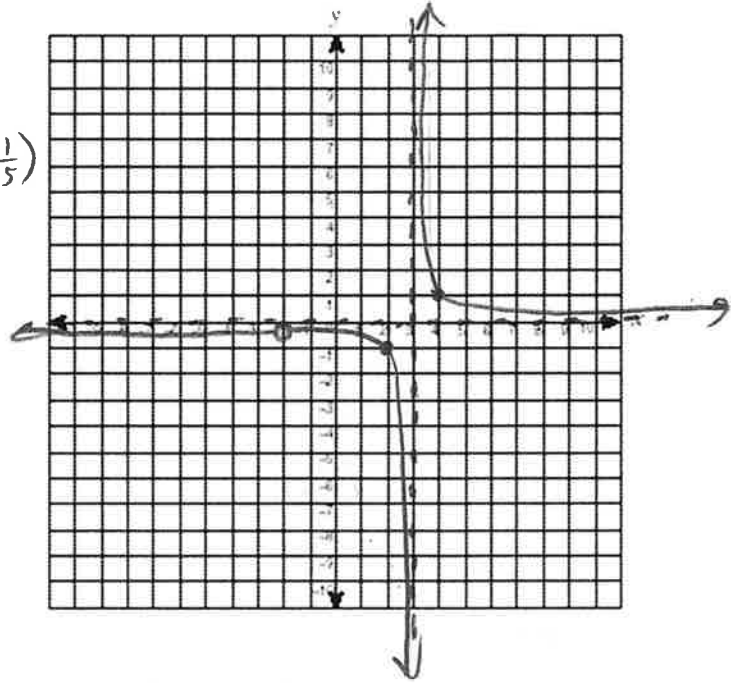
Rational Functions & Graphing Part 3 - Holes Worksheet

Graph the function & state any asymptotes, hole coordinates, domain, range, x-int, y-int

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

x	y
2	-1
4	1
3 ⁻	-∞
3 ⁺	∞
-10	- $\frac{1}{13}$
10	$\frac{1}{7}$

hole coord: $x = -2$
 $y = \frac{1}{-2-3} = -\frac{1}{5}$ $(-2, -\frac{1}{5})$

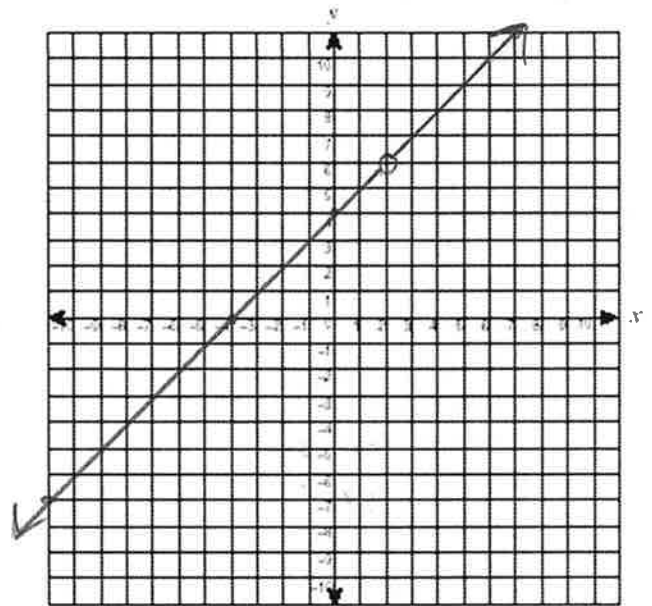


Vert Asymp: $x = 3$
 Horiz Asymp: $y = 0$
 Hole Coord: $(-2, -\frac{1}{5})$
 Domain: $x \neq -2, 3$
 Range: $y \neq 0, -\frac{1}{5}$
 x-int: \emptyset
 y-int: $-\frac{1}{3}$ (at $x=0$)

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

x	y

hole coord: $x = 2$
 $y = 2+4 = 6$ $(2, 6)$
 graph $y = x+4$
 $b = 4$ with hole $(2, 6)$
 $m = \frac{1}{1}$



Vert Asymp: none
 Horiz Asymp: none
 Hole Coord: $(2, 6)$
 Domain: $x \neq 2$
 Range: $y \neq 6$
 x-int: -4
 y-int: 4

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

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

hole coord: $x = -1$

$$y = -\frac{1}{x} = -\frac{1}{-1} = 1 \quad (-1, 1)$$

x	y
-1	1 (hole)
1	-1
0 ⁻	∞
0 ⁺	$-\infty$
-10	$-\frac{1}{10}$
10	$-\frac{1}{10}$

Vert Asymp: $x = 0$

Horiz Asymp: $y = 0$

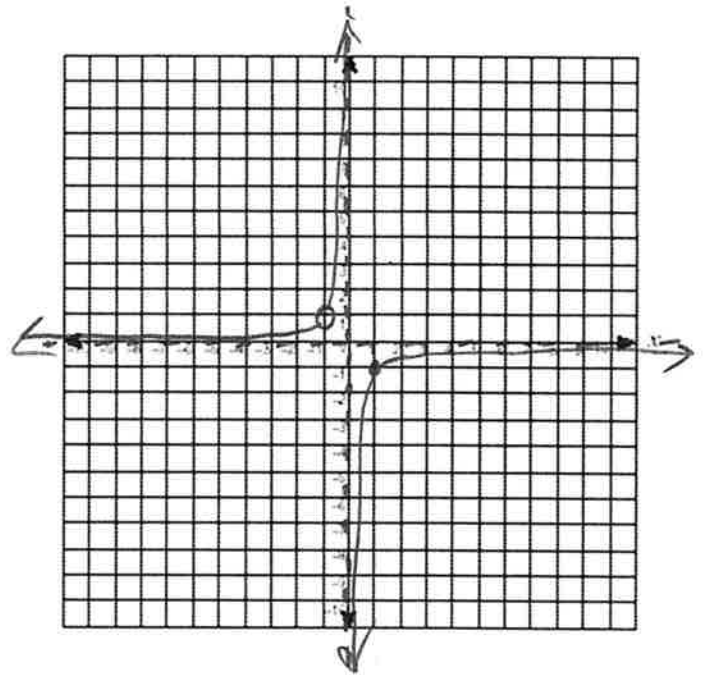
Hole Coord: $(-1, 1)$

Domain: $x \neq -1, 0$

Range: $y \neq 0, 1$

x-int: \emptyset

y-int: \emptyset



$$4) y = \frac{x-3}{x^2-9}$$

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

hole coord: $x = 3$

$$y = \frac{1}{x+3} = \frac{1}{3+3} = \frac{1}{6} \quad (3, \frac{1}{6})$$

x	y
-4	-1
-2	1
-3 ⁺	∞
-3 ⁻	$-\infty$
-10	$-\frac{1}{7}$
10	$\frac{1}{13}$

Vert Asymp: $x = -3$

Horiz Asymp: $y = 0$

Hole Coord: $(3, \frac{1}{6})$

Domain: $x \neq -3, 3$

Range: $y \neq 0, \frac{1}{6}$

x-int: \emptyset

y-int: $\frac{1}{3}$

