Name Answer Key

Date _____ Period _____

Advanced Algebra

6.4 Review

x	y
-2	-1/2
-1	-1
-1/2	-2
1/2	2
1	1
2	1/2

Find the characteristics listed for each rational function. Graph using an x/y table.

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

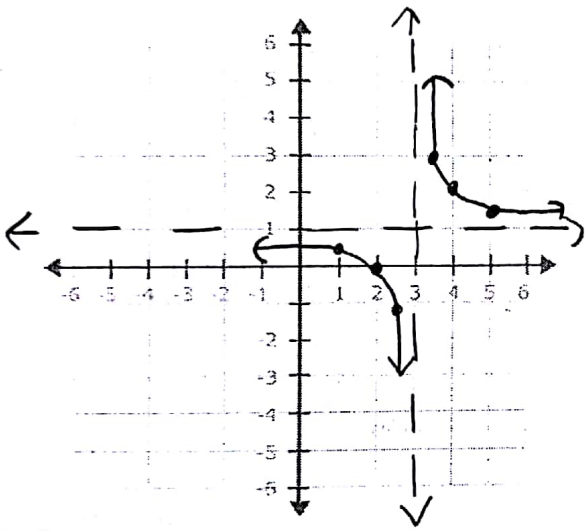
Vertical Asymptote: $x = 3$

Horizontal Asymptote: $y = 1$

Domain: $x \neq 3$

Range: $y \neq 1$

x+3	y+1
1	.5
2	0
2.5	-1
3.5	3
4	2
5	1.5



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

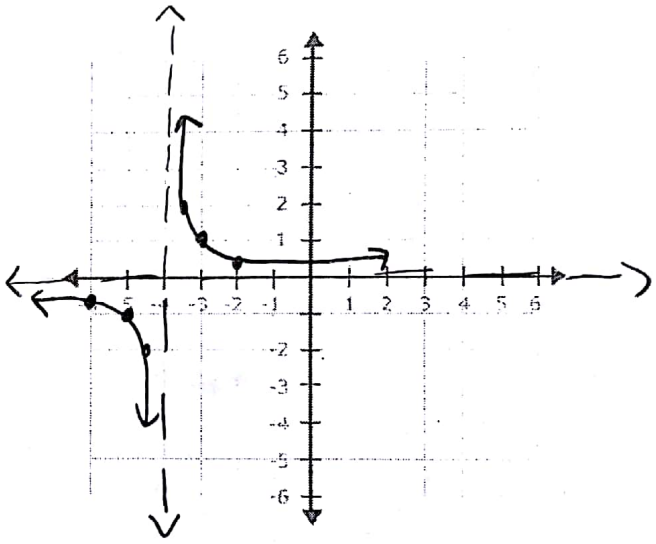
Vertical Asymptote: $x = -4$

Horizontal Asymptote: $y = 0$

Domain: $x \neq -4$

Range: $y \neq 0$

x-4	y
-6	-1/2
-5	-1
-4.5	-2
-3.5	2
-3	1
-2	1/2



For problems 3-5, write a rational function given the characteristics.

3) zeros at -2 & -4, vertical asymptote at x=0 & x=3, horizontal asymptote at y=1

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

4) zeros at 0 & -9, vertical asymptote at x=-5

$$f(x) = \frac{x(x+9)}{x+5}$$

5) zero at 1, vertical asymptote at x=4, hole at x=2

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

Find the characteristics listed for each rational function. Graph using a graphing calculator.

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

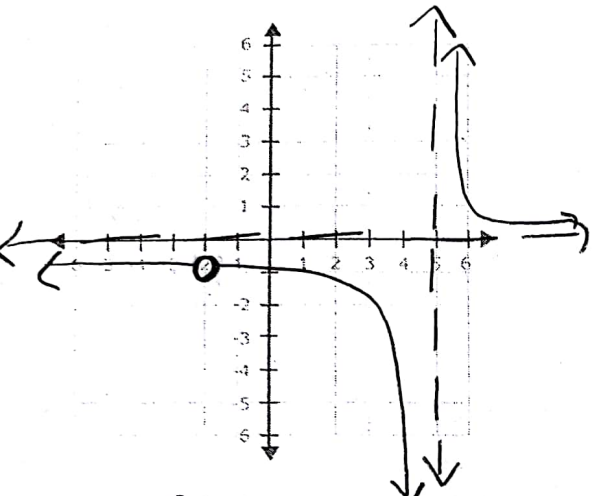
Hole(s): $x=-2$

Zero(s): None

Vertical Asymptote(s): $x=5$

Horizontal Asymptote: $y=0$

Slant Asymptote: None



7) $f(x) = \frac{2x^2-8x-64}{x^2-16} = \frac{2(x^2-4x-32)}{(x-4)(x+4)} = \frac{2(x-8)(x+4)}{(x-4)(x+4)}$

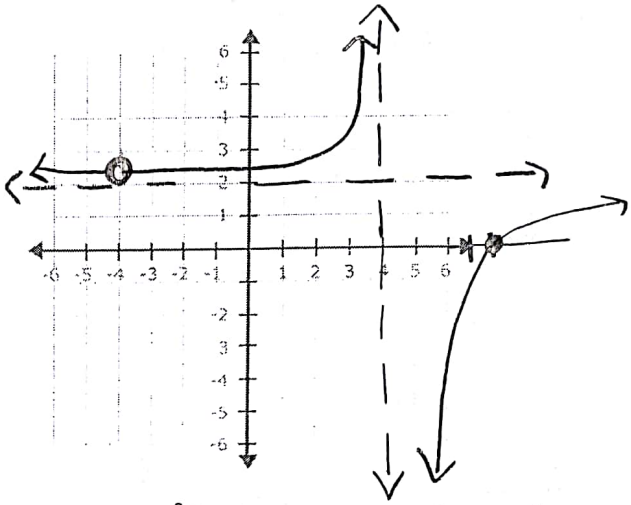
Hole(s): $x=-4$

Zero(s): $x=8$

Vertical Asymptote(s): $x=4$

Horizontal Asymptote: $y=2$

Slant Asymptote: None



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

Hole(s): None

Zero(s): $x=6, -1$

Vertical Asymptote(s): $x=1$

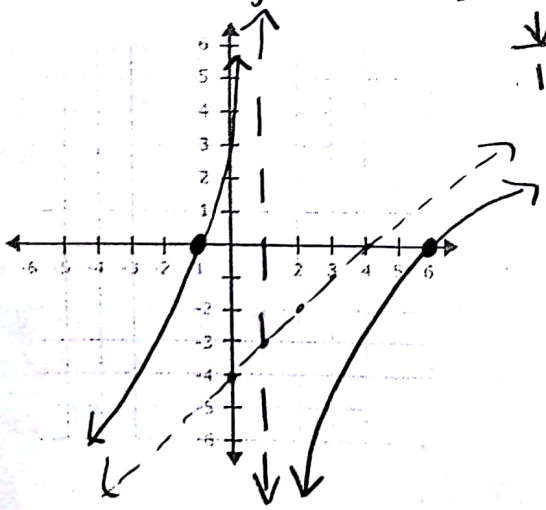
Horizontal Asymptote: None

Slant Asymptote: $y=x-4$

$1 \mid 1 \;\; -5 \;\; -6$

$\downarrow \;\; 1 \;\; -4$

$1 \;\; -4 \;\; -10$



9) $f(x) = \frac{x^2+2x-15}{x-3}$ $\frac{(x+5)(x-3)}{x-3}$

Hole(s): $x=3$

Zero(s): $x=-5$

Vertical Asymptote(s): None

Horizontal Asymptote: None

Slant Asymptote: None