Algebra 2 Worksheet

Name: Key

Section 8.4 – Rational Functions DAY ONE

Period: __

I. State the asymptotes.

1. $g(x)=\frac{1}{x}+4$	2. $f(x)=\frac{6}{x+2}-3$	3. $h(x)=\frac{-1}{x-5}$
Vertical Asymptote: $x=0$	Vertical Asymptote: $x=-2$	Vertical Asymptote: $x=5$
Horiz. Asymptote: $y=4$	Horiz. Asymptote: $y=-3$	Horiz. Asymptote: $y=0$

II. State the domain and range.

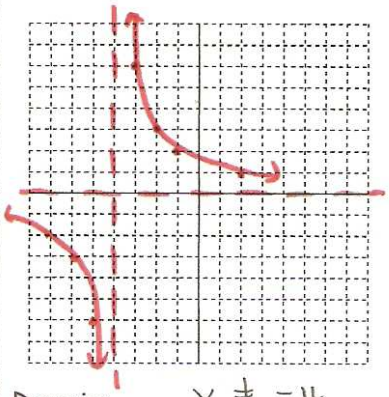
4. $g(x)=\frac{-2}{x-3}-1$	5. $f(x)=\frac{1}{x}-6$	6. $h(x)=\frac{3}{x+1}+3$
Domain: $x\neq 3$	Domain: $x\neq 0$	Domain: $x\neq -1$
Range: $y\neq -1$	Range: $y\neq -6$	Range: $y\neq 3$

III. Write an equation for the function with the given asymptotes if the parent function is $f(x)=\frac{1}{x}$.

7. $x=1$ and $y=0$	8. $x=-4$ and $y=-1$	9. $x=0$ and $y=8$
$f(x)=\frac{1}{x-1}+0$	$f(x)=\frac{1}{x+4}-1$	$f(x)=\frac{1}{x-0}+8$

IV. Using the graph of $f(x)=\frac{1}{x}$, describe the transformations and then graph.

10. $f(x)=\frac{6}{x+4}$



moved 4 to the left

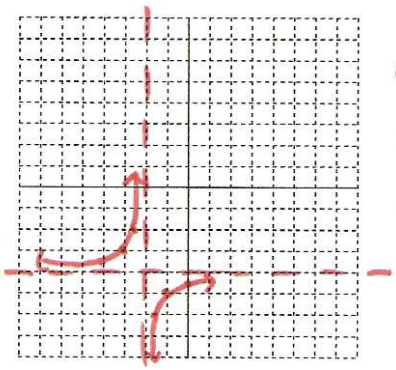
Domain: $x\neq -4$

Range: $y\neq 0$

Vertical Asymptote: $x=-4$

Horiz. Asymptote: $y=0$

11. $g(x)=\frac{-1}{x+2}-4$



reflected across x-axis
2 to the left
down 4

Domain: $x\neq -2$

Range: $y\neq -4$

Vertical Asymptote: $x=-2$

Horiz. Asymptote: $y=-4$

V. Identify the holes (if any) for each rational function.

12. $f(x)=\dfrac{x^2-4x+4}{x-2}$

$f(x)=\dfrac{(x-2)\cancel{(x-2)}}{\cancel{x-2}}$

$f(x)=x-2$

$f(2)=2-2$

Hole @ (2 , 0)

13. $g(x)=\dfrac{x^2-5x-6}{x-3}$

$g(x)=\dfrac{(x-6)(x+1)}{x-3}$

none

Hole @ (~~___~~ , ~~___~~)

14. $h(x)=\dfrac{2x^2+9x+4}{x+4}$

$h(x)=\dfrac{(2x+1)\cancel{(x+4)}}{\cancel{x+4}}$

$h(x)=2x+1$

$h(-4)=2(-4)+1$

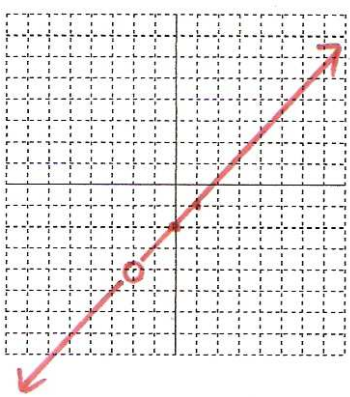
Hole @ (−4 , −7)

VI. Identify the holes in the graph of each function and then graph.

15. $f(x)=\dfrac{x^2-4}{x+2}$

$f(x)=\dfrac{\cancel{(x+2)}(x-2)}{\cancel{x+2}}$

$f(x)=x-2$



Coordinates of the Hole: (−2 , −4)

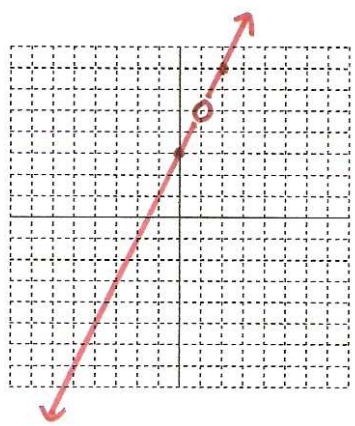
Domain: $x \neq -2$

Range: $y \neq -4$

16. $g(x)=\dfrac{2x^2+x-3}{x-1}$

$g(x)=\dfrac{(2x+3)\cancel{(x-1)}}{\cancel{x-1}}$

$g(x)=2x+3$



Coordinates of the Hole: (1 , 5)

Domain: $x \neq 1$

Range: $y \neq 5$

Be sure to seek help if you need it.

We are learning more regarding rational functions next class!