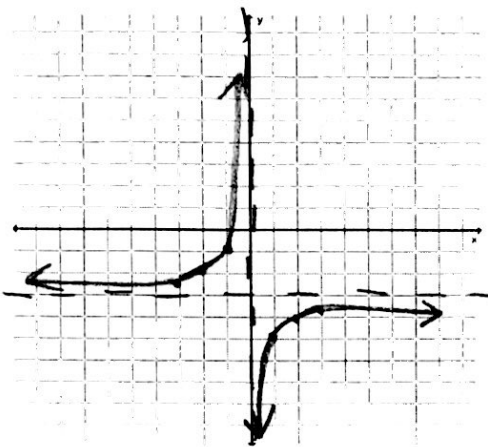


Lesson 8.2 & 8.4 Review Worksheet

Name: KEY

Graph the function. Identify the graph's asymptotes and the function's domain and range.

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



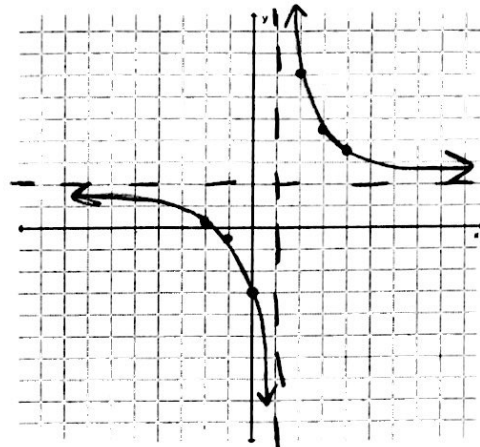
X	y
-3	-2.3
-2	-2
-1	-1
0	-
1	-5
2	-4
3	-3.7

asymptotes: VA: $x=0$ HA: $y=-3$

domain: $\mathbb{R}, x \neq 0$

range: $\mathbb{R}, y \neq -3$

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



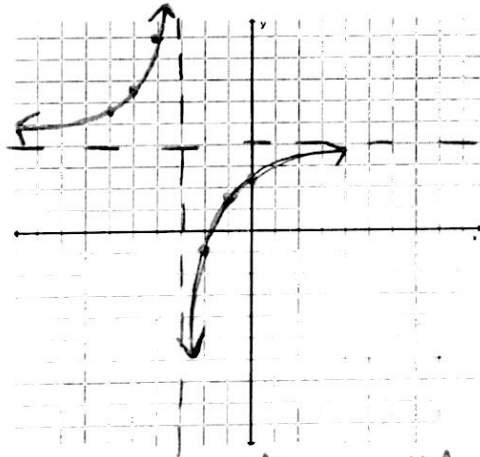
X	y
-2	0.3
-1	-0.5
0	-3
1	-
2	7
3	4.5
4	3.7

asymptotes: VA: $x=1$ HA: $y=2$

domain: $\mathbb{R}, x \neq 1$

range: $\mathbb{R}, y \neq 2$

3.) $y = \frac{4x+7}{x+3}$



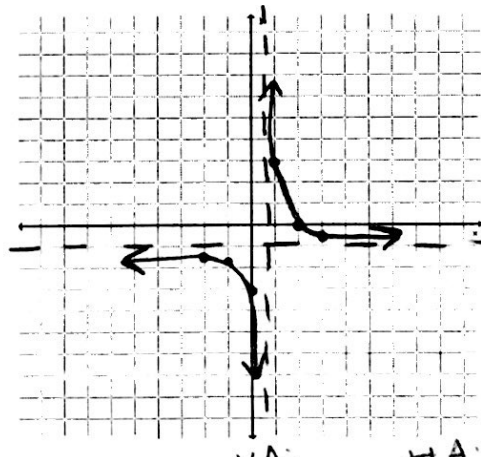
X	y
-6	5.7
-5	6.5
-4	9
-3	-
-2	-1
-1	1.5
0	2.3

asymptotes: VA: $x=-3$ HA: $y=4$

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

range: $\mathbb{R}, y \neq 4$

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



X	y
-2	-1.5
-1	-1.8
0	-3
2/3	-
1	3
2	0
3	-0.4

asymptotes: VA: $x=2/3$ HA: $y=-1$

domain: $\mathbb{R}, x \neq 2/3$

range: $\mathbb{R}, y \neq -1$

Simplify the rational expression, if possible.

$$5.) \frac{x^2 + x - 6}{x^2 + 9x + 18}$$

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

$$\boxed{\frac{x-2}{x+6}}$$

$$6.) \frac{x^3 - 100x}{x^4 + 20x^3 + 100x^2}$$

$$\frac{x(x^2 - 100)}{x^2(x^2 + 20x + 100)}$$

$$\frac{\cancel{x}(x+10)(x-10)}{x \cdot \cancel{x}(x+10)(x+10)} \quad \boxed{\frac{x-10}{x(x+10)}}$$

$$7.) \frac{x^2 - 5x - 84}{2x^2 - 98}$$

$$\frac{(x+7)(x-12)}{2(x^2 - 49)}$$

$$\frac{(x+7)(x-12)}{2(x+7)(x-7)}$$

$$\boxed{\frac{x-12}{2(x-7)}}$$

Multiply or divide the expressions. Simplify the result.

$$8.) \frac{6x^2y}{xy^2} \cdot \frac{2y}{9x^3}$$

$$\frac{3 \cdot 2 \cdot x \cdot x \cdot y}{x \cdot y \cdot y} \cdot \frac{2 \cdot y}{3 \cdot 3 \cdot x \cdot x \cdot x}$$

$$\frac{3 \cdot 2 \cdot x \cdot x \cdot y \cdot y}{3 \cdot 3 \cdot x \cdot x \cdot x \cdot y \cdot y}$$

$$\boxed{\frac{4}{3x^2}}$$

$$2 \cdot -6 = -12$$

$$\begin{matrix} \wedge \\ -4 + 3 = -1 \end{matrix}$$

$$2x^2 - 4x + 3x - 6$$

$$2x(x-2) + 3(x-2)$$

$$(x-2)(2x+3)$$

$$9.) \frac{2x^2 - x - 6}{2x^2 + 5x + 3} \cdot \frac{x^2 + x}{x^2 - 4}$$

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

$$\frac{x \cdot \cancel{(x-2)} \cdot \cancel{(2x+3)} \cdot (x+1)}{\cancel{(2x+3)} \cdot (x+1) \cdot (x+2) \cdot \cancel{(x-2)}}$$

$$\boxed{\frac{x}{x+2}}$$

$$10.) \frac{3x^2 + 15x}{x^2 - 12x + 36} \cdot \frac{x(2x+3) + 1(2x+3)}{(x^2 - x - 30)(2x+3)(x+1)}$$

$$\frac{3x(x+5)}{(x-6)(x-6)} \cdot \frac{(x-6)(x+5)}{1}$$

$$\frac{3 \cdot x \cdot (x+5) \cdot \cancel{(x-6)} \cdot (x+5)}{(x-6) \cdot \cancel{(x-6)}}$$

$$\boxed{\frac{3x(x+5)^2}{x-6}}$$

$$2 \cdot 3 = 6$$

$$\begin{matrix} \wedge \\ 3 + 2 = 5 \end{matrix}$$

$$11.) \frac{12x^8y}{5y^5} \div \frac{3y^2}{x^2}$$

$$\frac{12x^8y}{5y^5} \cdot \frac{x^2}{3y^2}$$

$$\frac{2 \cdot 2 \cdot 3 \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot y}{5 \cdot 3 \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y}$$

$$\boxed{\frac{4x^{10}}{5y^6}}$$

$$2 \cdot -24 = -48$$

$$\begin{matrix} \wedge \\ -16 + 3 = -13 \end{matrix}$$

$$12.) \frac{6x^2 + x - 1}{4x^3 + 4x^2} \div \frac{6x^2 - 2x}{x^2 - 4x - 5}$$

$$\frac{6x^2 + x - 1}{4x^3 + 4x^2} \cdot \frac{x^2 - 4x - 5}{6x^2 - 2x}$$

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

$$\frac{(2x+1) \cdot \cancel{(3x-1)} \cdot (x-5) \cdot \cancel{(x+1)}}{2 \cdot 2 \cdot 2 \cdot x \cdot x \cdot (x+1) \cdot \cancel{(3x-1)}}$$

$$\boxed{\frac{(2x+1)(x-5)}{8x^3}}$$

$$6 \cdot -1 = -6$$

$$\begin{matrix} \wedge \\ 3 + -2 = -1 \end{matrix}$$

$$13.) \frac{x^2 - 4x - 32}{2x^2 - 13x - 24} \div \frac{x}{4x^2 - 9}$$

$$\frac{x^2 - 4x - 32}{2x^2 - 13x - 24} \cdot \frac{4x^2 - 9}{x}$$

$$\frac{(x-8)(x+4)}{(x-8)(2x+3)} \cdot \frac{(2x+3)(2x-3)}{x}$$

$$\frac{\cancel{(x-8)} \cdot (x+4) \cdot \cancel{(2x+3)} \cdot (2x-3)}{x \cdot \cancel{(x-8)} \cdot \cancel{(2x+3)}}$$

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