

Honors Algebra 2 **

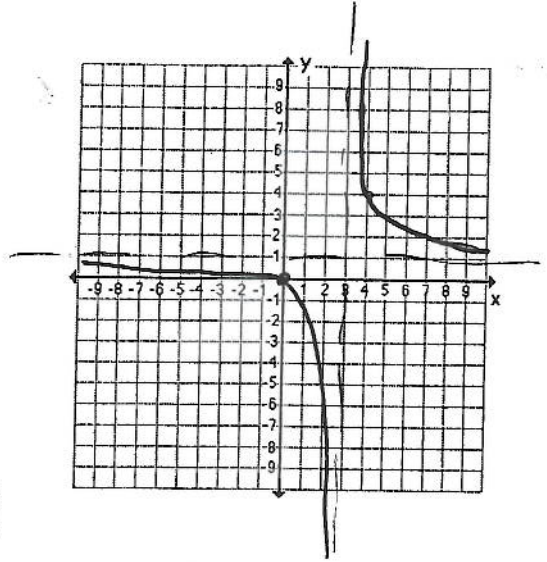
Quiz – Rational Functions

Name: _____

Date: _____ Per: _____

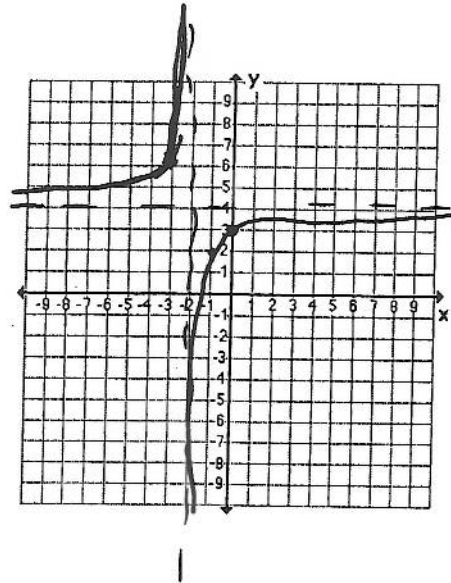
1. Graph $f(x) = \frac{3}{x-3} + 1$ and state the following properties:

- a. Domain: $\mathbb{R}, x \neq 3$
- b. Range: $\mathbb{R}, y \neq 1$
- c. Vertical Asymptotes: $x = 3$
- d. Horizontal Asymptotes: $y = 1$
- e. Increasing: ~~NEVER~~
- f. Decreasing: $(-\infty, 3) \cup (3, \infty)$
- g. Describe the transformation from the graph $g(x) = \frac{1}{x}$ Right 3, up 1



2. Graph $f(x) = \frac{4x+6}{x+2}$ and state the following properties:

- a. Domain: $\mathbb{R}, x \neq -2$
- b. Range: $\mathbb{R}, y \neq 4$
- c. Vertical Asymptotes: $x = -2$
- d. Horizontal Asymptotes: $y = 4$
- e. Increasing: $(-\infty, -2) \cup (-2, \infty)$
- f. Decreasing: ~~NEVER~~
- g. Describe the transformation from the graph $g(x) = \frac{1}{x}$ Left 2, up 4



- h. Convert $f(x) = \frac{5x+2}{x-1}$ to $f(x) = q(x) + \frac{r(x)}{d(x)}$

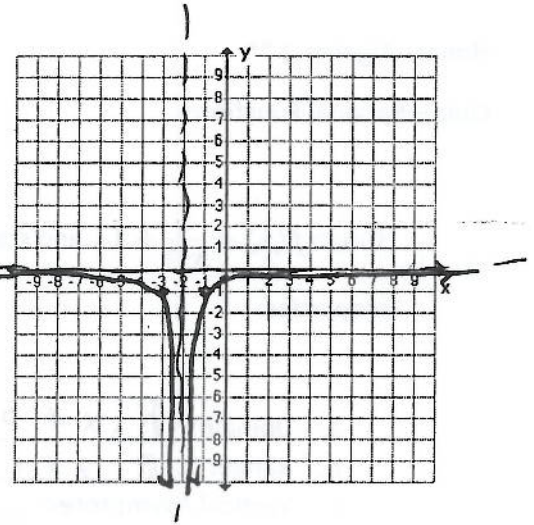
$$\begin{array}{r}
 5 \\
 x-1 \overline{) 5x+2} \\
 \underline{-(5x-5)} \\
 7
 \end{array}$$

$$f(x) = 5 + \frac{7}{x-1}$$

3. Graph $f(x) = -\frac{1}{(x+2)^2}$ and state the following

properties:

- a. Domain: $\mathbb{R}, x \neq -2$
- b. Range: $\mathbb{R}^-, y \neq 0 \text{ or } (-\infty, 0)$
- c. Vertical Asymptotes: $x = -2$
- d. Horizontal Asymptotes: $y = 0$
- e. Increasing: $(-2, \infty)$
- f. Decreasing: $(-\infty, -2)$
- g. Describe the transformation from the graph
 $g(x) = \frac{1}{x^2}$ Horiz Reflection, Left 2



4. Find the following properties for $y = \frac{x^2-x-6}{x^2-3x-10}$. DO NOT GRAPH

- a. Domain: $\mathbb{R}, x \neq 5, -2$
- b. Holes: $(-2, 5/7)$
- c. Vertical Asymptotes: $x = 5$
- d. HA Asymptotes: $y = 1$

$$y = \frac{(x-3)(x+2)}{(x-5)(x+2)}$$

$$y = \frac{x-3}{x-5} \quad \frac{-5}{-5}$$

5. State whether each example is direct variation, inverse variation or neither

a. $xy = \frac{2}{3}$

b.

x	6	2	4	1.5
y	10	30	15	40

$y = \frac{k}{x}$ $y = \frac{2/3}{x}$ Inverse

Inverse

$6 \cdot 10 = 60$
 $2 \cdot 30 = 60$
 $4 \cdot 15 = 60$
 $1.5 \cdot 40 = 60$

6. If y varies inversely with x, and $y = 8$ when $x = 5$,

a. Find the inverse equation: $y = \frac{40}{x}$

b. What is y when $x = 10$. $y = \frac{40}{10} = 4$

$y = \frac{k}{x}$
 $8 = \frac{k}{5} \quad k = 40$

so, $xy = k$
 or $y = \frac{k}{x}$

Translate each sentence into a formula. Use K as the constant of variation.

7. P varies jointly with b and c: $P = Kbc$

8. The length of time (t) it takes a satellite to complete a circular orbit varies directly as the radius (r) of the orbit and inversely as the velocity (v).

$t = \frac{Kr}{v}$