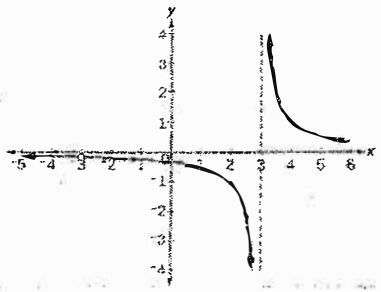
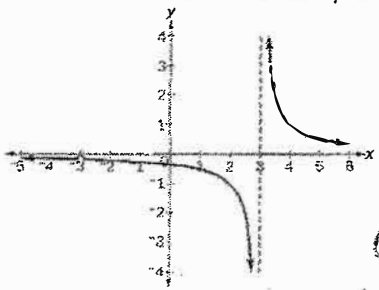
Rational and Radical Functions Review

Name:_____A#____

Without my notes I can...				
Yes	**No**	**I can...**	**Correct**	**Incorrect**
		1. Factor a quadratic with an 'a' value not equal to one. $6x^2 + 7x - 3$ $(3x-1)(2x+3)$		
		2. Identify the removable and essential discontinuities from a graph.  VA @ $x=3$ hole @ $x=-3$		
		3. Describe end behavior, asymptotic behavior, domain, and range of a rational function.  as $x \to \infty, y \to 0$ as $x \to -\infty, y \to 0$ as $x \to 3^+, y \to \infty$ as $x \to 3^-, y \to -\infty$ D: $x \neq -3, 3$ R: $y \neq 0$ $g(x) = \frac{2(x-1)}{(x-1)(x-4)}$ D: $x \neq 1, 4$ R: $y \neq 0$ as $x \to \infty, y \to 0$ as $x \to -\infty, y \to 0$ as $x \to 4^+, y \to \infty$ as $x \to 4^-, y \to -\infty$		

4. Determine essential and removable discontinuities of a rational expression from factored form.

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

VA @ $x=4$

hole @ $x=1$

5. Add rational expressions. List any restrictions on the domain.

a. $\frac{(3x-5)}{x+2} + \frac{2x+3}{x+2}$

$\frac{5x-2}{x+2}$ $\quad x \neq -2$

b. $\frac{2x}{3x-2} + \frac{6}{x+1}$

$\frac{2x^2+20x-12}{3x^2+x-2}$ $\quad x \neq 2/3, -1$

6. Subtract rational expressions. List any restrictions on the domain.

a. $\frac{4-x}{(x+2)(2x-1)} - \frac{3+4x}{(x+2)(2x-1)}$

$\frac{-5x+1}{2x^2+3x-2}$ $\quad x \neq -2, 1/2$

b. $\frac{x+3}{3x} - \frac{2x+7}{x-4}$

$\frac{-5x^2 - 22x - 12}{3x^2 - 12}$ $x \neq 0, 4$

7. Multiply rational expressions. List any restrictions on the domain.

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

$\frac{8x^3 + 64x^2 + 128}{x-3}$ $x \neq 3, -2$

b. $\frac{3x^2-6x-24}{x^2-2x-3} \cdot \frac{x-3}{6x^2+12x}$

$\frac{x-4}{2x^2+2x}$ $x \neq 3, -1, 0, -2$

8. Divide rational expressions. List any restrictions on the domain.

a. $\frac{(x-4)(x+2)}{x(x-3)} \div \frac{(x-4)}{2x(x-3)(x+2)}$

$2x^2 + 8x + 8$ $x \neq 0, 3, 4, -2$

b. $\frac{2x^2+3x-2}{6x^2-24x} \div \frac{2x^2-3x+1}{3x-12}$

$\frac{x+2}{2x^2 - 2x}$ $x \neq 0, 4, 1/2, 1$

9. Solve rational functions in context.

a. One pipe can fill a pool 1.25 times faster than a second pipe. When both pipes are opened, they fill the pool in 5 hours. How long would it take to fill the pool if only the slower pipe is used?

11.25 hours

b. Working together, Bill and Tom painted a fence in 8 hours. Last year, Tom painted the fence by himself. The year before, Bill painted it by himself, but took 12 hours less than Tom took. How long did Bill and Tom take, when each was painting alone?

Tom - 24 hours Bill - 12 hours

c. Jamie has won 8 out of 15 golf tournaments this season. How many more consecutive golf tournaments would Jamie have to win in order to improve her winning percentage to 65%?

$x = 5$

10. Solve rational functions. Check for any extraneous solutions.

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

$x = 4/3$