Name:_____ Date:_____
PC: Simplifying Rational Expressions Ms. Loughran

A **rational expression** is a ratio of polynomials. A rational expression is said to be **undefined** if its denominator is zero.

1. For what value(s) of x does the expression have no meaning?

(a) $\frac{7}{x-3}$ (b) $\frac{12}{x+8}$ (c) $\frac{x-3}{x^2-16}$ (d) $\frac{x-2}{x^2+4}$

2. Find the value(s) of the variable for which each rational expression is not defined.

(a) $\frac{x^2-49}{2x^2-4x}$ (b) $\frac{5}{c^2-25}$ (c) $\frac{x-3}{x^2+9}$ (d) $\frac{6}{3x^2-8x+4}$

Simplify each expression.

3. $\frac{x^2+6x}{x}$

4. $\frac{x^2}{x^2+3x}$

5. $\frac{5b^2-5ab}{2a^2-2ab}$

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

7. $\frac{5x^2-15x}{27x-3x^2}$

8. $\frac{x^2-x-6}{3x^2-15x+18}$

9. $\frac{y^2-3y-18}{2y^2+5y+3}$

10. $\frac{x^2-y^2}{x^2-6y-xy+6x}$

11. $\frac{1-x^2}{x^3-1}$

12. $\frac{x^2+2x+xy+2y}{x^2+4x+4}$

13. $\dfrac{x^3+27}{x^3-3x^2+9x}$

Steps for Simplifying Rational Expressions:

1. Completely factor the numerator and denominator

2. Cancel common factors

***Note** $\dfrac{a-b}{b-a}=-1$

****Don't forget to write restrictions.****