

## 6.4 Simplifying Rational Expressions

Directions: Simplify the following rational expressions. State any restrictions on the variables.

1.  $1 + \frac{2}{x} - \frac{6}{4-x}$

$\frac{x+2}{x} \cdot \frac{x}{4x-6} = \frac{x+2}{4x-6}$   $x \neq 0, 1.5$

2.  $\frac{x^2-6x}{x^2-36} \cdot \frac{x+6}{x^2}$

$\frac{x(x-6)}{(x+6)(x-6)} \cdot \frac{x+6}{x^2} = \frac{1}{x} \cdot \frac{x+6}{x} = \frac{x+6}{x^2}$   $x \neq 0, \pm 6$

3.  $\frac{2}{n+4} - \frac{n^2}{n^2-16} = \frac{-2(n-4)-n^2}{(n+4)(n-4)} = \frac{8-2n-n^2}{(n+4)(n-4)} = \frac{(4+n)(2-n)}{(n+4)(n-4)} = \frac{2-n}{n-4}$

4.  $\frac{4}{x^2-25} + \frac{6}{x^2+6x+5}$

$\frac{4}{(x-5)(x+5)} + \frac{6}{(x+1)(x+5)}$   $x \neq \pm 5, -1$

$\frac{4(x+1)+6(x-5)}{(x-5)(x+5)(x+1)} = \frac{10x-26}{(x-5)(x+5)(x+1)}$

5.  $\frac{d^2+2d-35}{d^2-10d+25} \div \frac{d^2-49}{d^2+d-30}$

$\frac{(d+7)(d-5)}{(d-5)(d-5)} \div \frac{(d+7)(d-7)}{(d+7)(d-7)} = \frac{d+6}{d-7}$   $d \neq 7, -7, 5, -6$

$\frac{2-n}{n-4}$   $n \neq \pm 4$

6.5 Solving Rational Equations

$\frac{2}{2-x} = \frac{x}{6-x}$