Sec 9-4 Simplifying the Product or Quotient of Rational Expressions

- Factor all numerators and denominators.
- If mulitplying rational expressions you can simplify within the same fraction and/or cross cancel then write as a single fraction.
- Instead of dividing, multiply by the reciprocal then simplify. Write answer as a single fraction.
- State restrictions on the variable.

Simplify. State the restrictions on the variables.

$$\frac{8x^4+2x^3}{6x^2-24x}\cdot\frac{x^2+x-6}{4x^2+13x+3}$$

$(x+3)(x-2)$ over $(4x+1)(x+3)$

-6, $+3$, -2, $+1$

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

12, 1, 12, 13

x $+3$; $4x$ | $4x^2$ | $12x$; $+1$ | x | 3

$$=\frac{1\,x^2(x-2)}{3(x-4)} \qquad x\neq 0,4,-\tfrac{1}{4},-3$$

Simplify. State the restrictions on the variables.

$$\frac{x^2-16}{9x^2+18x}\div\frac{x^2-3x-4}{3x^2+6x}$$

-4, 1, -3

$$\frac{(x+4)(x-4)}{9x(x+2)}\times\frac{3x(x+2)}{(x-4)(x+1)}=\frac{3x(x+4)}{9x(x+1)}=\frac{(x+4)}{3(x+1)}$$

$$x\neq 0,-2,4,-1$$

Simplify. State restrictions on the variable.

$$\frac{x^2+3x-10}{2x^2+x-3}\div\frac{x^3+5x^2-4x-20}{x^2+x-2}$$

$(x+2)(x-1)$

x $+5$; x^2 | x^3 | $+5x^2$; -4 | $-4x$ | -20

$(x^2-4)(x+5)$

$(x+2)(x-2)(x+5)$

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

$$=\frac{x-3}{(2x+3)(x-2)} \qquad x\neq -\tfrac{3}{2},1,-2,2,-5$$

Hwk #33 Sec 9-4

Pages 511-513

Problems 5, 6, 10, 11, 16, 17, 23, 27, 39

Due Thursday

Simplify.

LCD = 36

$\frac{2}{2} \cdot \frac{7}{18} + \frac{11}{12} \cdot \frac{3}{3}$

$= \frac{14}{36} + \frac{33}{36} = \frac{47}{36}$

Find this sum:

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

$\frac{5x-20+(2x+6)}{(x+3)(x-4)} = \frac{7x-14}{(x+3)(x-4)}$

Find this sum:

$\frac{6}{x^2-25} + \frac{7}{x^2-6x+5}$

$-1 \quad -5$
-6

$\frac{x-1}{x-1} \cdot \frac{6}{(x+5)(x-5)} + \frac{7}{(x-1)(x-5)} \cdot \frac{x+5}{x+5}$

$\frac{6x-6+7x+35}{(x-1)(x+5)(x-5)} = \frac{13x+29}{(x-1)(x+5)(x-5)}$