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 and finally multiply and 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.

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

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

12, 12, 1, 13

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

$$\frac{x^2(x-2)}{3(x-4)}$$

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

Simplify. State the restrictions on the variables.

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

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

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

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

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

$x \neq -\frac{3}{2}, 1, -5, \pm 2$

Hwk #7 Sec 9-4

Pages 511

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

Find this sum:

$$\frac{11}{56} + \frac{7}{64}$$

If you factor the denominators first you notice that they already have an 8 in common. Therefore, all you need to do is multiply the first fraction by 8/8 and the second by 7/7 to make the denominators the same.

$$\frac{8}{8} \cdot \frac{11}{7 \cdot 8} + \frac{7}{8 \cdot 8} \cdot \frac{7}{7} = \frac{88 + 49}{8 \cdot 8 \cdot 7}$$

$$= \frac{137}{448}$$