

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

- Factor all numerators and denominators.
- If multiplying 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.

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

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

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

Handwritten work includes a cross-cancellation diagram for the first fraction (12/12, 13/13) and a box for the second fraction (x+3, 12x, x+3, x+3).

Simplify. State the restrictions on the variables.

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

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

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

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

Simplify. State the restrictions on the variables.

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

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

$$\frac{x^2}{x^2} \cdot \frac{x^2}{+5x^2}$$

$$-4 \cdot \frac{-4x}{-20}$$

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

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

$$\frac{-6}{3} \cdot \frac{2x}{-3x}$$

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

You can now finish Hwk #40

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

Find this sum without using a calculator.

$$\frac{11}{56} + \frac{7}{64}$$
$$\frac{8}{8} \cdot \frac{11}{7 \cdot 8} + \frac{7}{8 \cdot 8} \cdot \frac{7}{7}$$
$$\frac{88}{8 \cdot 8 \cdot 7} + \frac{49}{8 \cdot 8 \cdot 7} = \frac{137}{8 \cdot 8 \cdot 7}$$

Find this sum:

$$\frac{6}{x^2 - 25} + \frac{7}{x^2 - 6x + 5}$$
$$\frac{(x-1) \cdot 6}{(x-1)(x+5)(x-5)} + \frac{7}{(x-5)(x-1)} \cdot \frac{(x+5)}{(x+5)}$$
$$\frac{6x-6}{(x-1)(x+5)(x-5)} + \frac{7x+35}{(x-5)(x-1)(x+5)}$$
$$\frac{13x+29}{(x+5)(x-5)(x-1)}$$