

Do Now:

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

$$\frac{\cancel{1(x-2)}}{-1(\cancel{x-2})} = \boxed{-1}$$

$$2) \frac{3x-6}{8-4x}$$

opposite factors

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

$$\frac{3}{4} \left(\frac{1}{-1} \right) = \boxed{-\frac{3}{4}}$$

Homework:

- 1) Mult/Divide Set B Left Col (7-16),
- 2) Divide Set C- Left Col (12-16)
- 3) Add/Sub Rationals: Set D (Left col 11-18)

HW Review: Simplifying Rational Expressions: Set A (1-35 odd)

$$\textcircled{23} \quad \frac{y^2-81}{(y-9)^2} = \frac{\cancel{(y-9)}(y+9)}{\cancel{(y-9)}(y-9)}$$

$$\textcircled{25} \quad \frac{3a+3}{a^2-1} = \frac{3(\cancel{a+1})}{(\cancel{a+1})(a-1)} = \frac{3}{a-1}$$

↑

Multiplying Rational Expressions

MULTIPLYING

- 1) Factor both numerator and denominator.
- 2) Divide both numerator and denominator by the greatest common factor (GCF).
- 3) Multiply remaining numerators, and then multiply remaining denominators.
- 4) Reduce (if possible).

$$\frac{3}{x} \cdot \frac{x}{30} =$$

$$\frac{18b^2}{x-y} \cdot \frac{x-y}{6b} =$$

$$\frac{15x}{23x} \cdot \frac{2y}{5} =$$

$$\frac{y^2 + 2y - 3}{y^2 - 3y - 18} \cdot \frac{4y^2 - 24y}{2y - 2} = \frac{\cancel{(y+3)}\cancel{(y-1)}}{\cancel{(y-6)}\cancel{(y+3)}} \cdot \frac{4y\cancel{(y-6)}}{\cancel{2}(y-1)} = 2y$$

$$\frac{64y^3}{y-8} \cdot \frac{8-y}{(4y)^3} =$$

Dividing Rational Expressions

DIVIDING

To divide by a fraction, multiply by the **reciprocal** of the divisor.

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{ad}{bc}$$

Example:

$$\frac{3}{4} \div \frac{2}{5} =$$

$$\frac{5}{x} \div \frac{15}{x^2} =$$

$$\frac{x^3}{24} \div \frac{x}{6} =$$

$$\frac{a-b}{64x^2} \div \frac{a-b}{8x^4} =$$

$$\frac{x^2 - 2x - 8}{3x - 12} \div \frac{x^2 - 4}{9x^2 - 18x} =$$

$$\frac{a-b}{64x^2} \div \frac{a-b}{8x^4} =$$



$$\frac{x^2 - 2x - 8}{3x - 12} \div \frac{x^2 - 4}{9x^2 - 18x} = \frac{\cancel{(x-4)}\cancel{(x+2)}}{3\cancel{(x-4)}} \cdot \frac{\cancel{(x-2)}\cancel{(x+2)}}{9x\cancel{(x-2)}}$$

$$\frac{\cancel{(x-4)}\cancel{(x+2)}}{3\cancel{(x-4)}} \times \frac{3\cancel{(x-2)}}{\cancel{(x-2)}\cancel{(x+2)}}$$

$$\boxed{3x}$$

$$\frac{y-5}{y+8} \div \frac{y-5}{y+8} = 1 \text{ for all rational}$$

values of y where $y \neq$ _____.

2-Div, Add, Sub, Complex notes per 6.notebook

Adding and Subtracting Rational Expressions

- 1) FACTOR FIRST.
- 2) Find the LCD—Least Common Denominator.
- 3) Change each fraction to an equivalent fraction having the LCD.
- 4) Add or subtract numerators (denominator will be the LCD).
- 5) Reduce to lowest terms.

$$\frac{2x}{3} + \frac{x}{9}$$

$$\frac{3}{8x} + \frac{1}{3x} + \frac{5}{12x}$$

$$\frac{2a+b}{a^2b^3} + \frac{a-2b}{ab^2}$$

$$\frac{7}{x} + \frac{6}{x+5}$$

$$\frac{2}{x^2-4} - \frac{1}{x^2+2x}$$

$$\frac{5x}{x-3} - \frac{3x}{3-x}$$

$$\frac{7}{x} + \frac{6}{x+5}$$

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

$$\frac{2x}{x(x+2)(x-2)} - \frac{x-2}{x(x+2)(x-2)}$$

$$\frac{5x}{x-3} - \frac{3x}{3-x}$$

$$\frac{2x - x + 2}{x(x+2)(x-2)} = \frac{x+2}{x(x+2)(x-2)}$$

$$\frac{1}{x(x-2)}$$

★ Complex Fractions

"Fraction within a fraction"

To Simplify a Complex Fraction:

Method 1: Find the LCD of all fractions appearing within the complex fraction. Multiply numerator and denominator of complex fraction by LCD.

Method 2: Create a single fraction in numerator and single fraction in denominator. Rewrite with "÷" and proceed (multiply by reciprocal).

$$1. \frac{\frac{1}{3} - \frac{1}{4}}{\frac{1}{2} + \frac{1}{8}}$$



$$2. \frac{3 + \frac{2}{5}}{1 - \frac{3}{7}}$$

$$3. \frac{1 + \frac{1}{a}}{1 - \frac{1}{a}}$$

$$4. \frac{1 - \frac{9}{x^2}}{1 - \frac{1}{x} - \frac{6}{x^2}}$$

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

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

$$7. \frac{\frac{4a}{2a^3+2}}{\frac{8a}{4a+4}}$$

$$8. \frac{\frac{1}{x+3} + \frac{1}{x-3}}{\frac{1}{x+3} - \frac{1}{x-3}}$$

2-Div, Add, Sub, Complex notes per 6.notebook

