

OBJECTIVE: I can add or subtract rational expressions.

### REVIEW

Simplify.

$$1. \frac{5}{6} + \frac{7}{8} = \frac{\cancel{2} \cdot 5 \cdot 4}{\cancel{2} \cdot \cancel{3} \cdot 4} + \frac{7 \cdot 3}{\cancel{2} \cdot \cancel{2} \cdot 2 \cdot 3} = \frac{20 + 21}{24} = \frac{41}{24}$$

### Steps for adding and subtracting rational expressions

1. FACTOR to find lowest common denominator (LCD).

\*\* multiply by what's missing

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2. Multiply TOP AND BOTTOM (actually show this) by missing factors in LCD to make denominators the same.

★ 3. MULTIPLY numerator BEFORE you ADD or SUBTRACT!!!!!!!!!!!!!!

4. Add or subtract like terms.

\*\* subtract = distribute

5. IF you can, factor the answer which should be a single fraction and simplify. (Do what we did yesterday.)

EXAMPLES: Simplify.

$$1. \frac{5}{(x-2)} + \frac{8x}{(x-2)} = \frac{5+8x}{x-2}$$

$$2. \frac{3x^2-x}{2x+3} - \frac{4x+7}{2x+3}$$

$$\frac{3x^2-5x-7}{2x+3}$$

$$3. \frac{3 \cdot 3x}{7x \cdot 3x} - \frac{4}{21x^2}$$

$$\frac{9x-4}{21x^2}$$

$$4. \frac{1}{a-1} - \frac{1}{a^2-a}$$

$$a \frac{1 \cdot a}{a(a-1)} + \frac{-1}{a(a-1)}$$

$$\frac{a-1}{a(a-1)}$$

$$\frac{1}{a}$$

$$5. \frac{2}{x^2-25} - \frac{1}{2x+10}$$

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

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

$$\frac{-x+9}{2(x-5)(x+5)}$$

$$6. \frac{x-1}{x^2-6x+5} + \frac{x}{x-5}$$

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

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

$$\frac{x^2-1}{(x-5)(x-1)}$$

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

$$\frac{x+1}{x-5}$$

$$7. \frac{x}{x^2+5x+6} - \frac{2}{x^2+4x+4}$$

$$\frac{x(x+2)}{(x+2)(x+3)} + \frac{-2(x+2)}{(x+2)(x+2)(x+3)} \quad x^2-8x+15$$

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

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

$$8. \frac{x-5}{2x+6} - \frac{x-7}{4x-12}$$

$$\frac{2(x-5)(x-3)}{(x-3)2 \cdot 2(x+3)} + \frac{(-x+7)(x+3)}{4(x-3)(x+3)}$$

$$\frac{2x^2-16x+30-x^2+4x-21}{4(x-3)(x+3)}$$

$$\frac{x^2-12x+9}{4(x-3)(x+3)}$$

$$9. \frac{-3}{x+4} - \frac{2}{-4-x}$$

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

$$\frac{-1}{-(x+4)}$$

$$10. \frac{5(x-3)}{(x-3)(x+4)} + \frac{7(x+4)}{(x-3)(x+4)}$$

$$\frac{5x-15+7x+28}{(x-3)(x+4)}$$

$$\frac{12x+13}{(x-3)(x+4)}$$

$$11. \frac{r+8}{r^2-6r-16} - \frac{5}{2r^2+4r}$$

$$\frac{2r(r+8)}{2r(r-8)(r+2)} + \frac{-5(r-8)}{2r(r+2)(r-8)}$$

$$\frac{2r^2+16r-5r+40}{2r(r-8)(r+2)}$$

$$\frac{2r^2+11r+40}{2r(r-8)(r+2)}$$

$$\frac{16}{11} \frac{80}{-5}$$

$$12. \frac{2}{x^2+11x+30} - \frac{4}{x^2-36}$$

$$\frac{2(x-6)}{(x+5)(x+6)(x-6)} + \frac{-4(x+5)}{(x+6)(x-6)(x+5)}$$

$$\frac{2x-12-4x-20}{(x+5)(x+6)(x-6)}$$

$$\frac{-2x-32}{(x+5)(x+6)(x-6)}$$