

Rational Expression Worksheet: Adding/Subtracting

Add or subtract these rational expressions. Show your common denominators and numerators on this sheet or separate paper. **FACTOR** denominators when possible.

1. $\frac{x-5}{x \cdot 8} - \frac{3}{8x}$

$$\boxed{\frac{5x-3}{8x}} \quad x \neq 0$$

2. $\frac{2}{4x+12} + \frac{7}{x+3} \cdot \frac{4}{4}$

$$\frac{2}{4(x+3)} + \frac{28}{4(x+3)} = \frac{30}{4(x+3)} = \boxed{\frac{15}{2(x+3)}} \quad x \neq -3$$

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

$$\frac{7(x-5)}{(x+2)(x-5)} - \frac{4(x+2)}{(x+2)(x-5)} \quad x \neq -2, 5$$

$$\frac{\boxed{7x-35} - \boxed{4x-8}}{(x+2)(x-5)} = \boxed{\frac{3x-43}{(x+2)(x-5)}}$$

4. $\frac{3}{y+5} + \frac{y}{y^2+7y+10}$

$$\frac{3(y+2)+y}{(y+5)(y+2)} = \frac{3y+6+y}{(y+5)(y+2)} =$$

$$\frac{4y+6}{(y+5)(y+2)} = \frac{2(2y+3)}{(y+5)(y+2)} \quad x \neq -5, -2$$

5. $\frac{5}{4x} + \frac{3}{2x} \cdot \frac{2}{2} \quad x \neq 0$

$$\frac{5+6}{4x} = \boxed{\frac{11}{4x}}$$

6. $\frac{2}{x-3} - \frac{1}{x+7} \quad x \neq 3, -7$

$$\frac{2(x+7) - 1(x-3)}{(x-3)(x+7)}$$

$$\frac{2x+14-x+3}{(x-3)(x+7)} = \boxed{\frac{x+17}{(x-3)(x+7)}}$$

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

$$\frac{35}{15x} - \frac{6x}{15x} = \boxed{\frac{35-6x}{15x}} \quad x \neq 0$$

2. $\frac{3}{3} \cdot \frac{3}{2x+6} + \frac{4}{6x+18}$

$$\frac{9+4}{6(x+3)} = \boxed{\frac{13}{6(x+3)}}$$

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

$$\frac{3(x-7) + 4(x+2)}{(x+2)(x-7)} = \frac{3x-21+4x+8}{(x+2)(x-7)}$$

$$= \boxed{\frac{7x-13}{(x+2)(x-7)}} \quad x \neq -2, 7$$

4. $\frac{1}{y+3} + \frac{4}{y^2+4y+3}$

$$\frac{y+1+4}{(y+1)(y+3)}$$

$$y \neq -1, -3 \quad \boxed{\frac{y+5}{(y+1)(y+3)}}$$

5. $\frac{2}{2} \cdot \frac{2}{5x} - \frac{3}{10x}$

$$\frac{4-3}{10x} = \boxed{\frac{1}{10x}} \quad x \neq 0$$

6. $\frac{2x+3}{5x-30} - \frac{3x+4}{x-6} \cdot \frac{5}{5} = \frac{2x+3 - (15x+20)}{5(x-6)}$

$$= \frac{2x+3-15x-20}{5(x-6)}$$

$$= \boxed{\frac{-13x-17}{5(x-6)}} \quad x \neq 0, 6$$

7. $\frac{2x}{x-11} + \frac{5}{x-11}$

$$\boxed{\frac{2x+5}{x-11}} \quad x \neq 11$$

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

$$\frac{6x-7+4(x+1)}{(x+5)(x+1)} = \frac{6x-7+4x+4}{(x+5)(x+1)}$$

$$\boxed{\frac{10x-3}{(x+5)(x+1)}} \quad x \neq -1, -5$$

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1. $\frac{5}{6x} - \frac{2}{3} \cdot \frac{2x}{2x} \quad x \neq 0$

$$\boxed{\frac{5-4x}{6x}}$$

2. $\frac{2}{5x-20} + \frac{7}{x-4} \left(\frac{5}{5}\right)$

$$5(x-4)$$

$$\frac{2+35}{5(x-4)} = \boxed{\frac{37}{5(x-4)}} \quad x \neq 4$$

3. $\frac{7}{x+2} - \frac{4}{3x+6}$

$$3(x+2) \quad x \neq -4$$

$$\frac{21-4}{3(x+2)} = \boxed{\frac{17}{3(x+2)}}$$

4. $\frac{3}{y+3} + \frac{2y}{y^2+7y+12} \quad x \neq -3, -4$

$$(y+3)(y+4)$$

$$\frac{3(y+4)+2y}{(y+3)(y+4)} = \frac{3y+12+2y}{(y+3)(y+4)}$$

5. $\frac{3}{3} \frac{5}{4x} + \frac{7}{12x} \quad x \neq 0$

$$\frac{15+7}{12x} = \frac{22}{12x} = \boxed{\frac{11}{6x}}$$

6. $\frac{2}{x-5} + \frac{3}{x-7} \quad x \neq 5, 7$

$$\frac{2(x-7)+3(x-5)}{(x-5)(x-7)} = \frac{2x-14+3x-15}{(x-5)(x-7)}$$

$$= \boxed{\frac{5x-29}{(x-5)(x-7)}}$$

7. $\frac{3x}{x-6} + \frac{6x}{4x-24}$

$$4(x-6)$$

$$\frac{12x+6x}{4(x-6)} = \frac{18x}{4(x-6)}$$

$$= \boxed{\frac{9x}{2(x-6)}} \quad x \neq 6$$

8. $\frac{5}{y+10} + \frac{4y}{y^2+12y+20}$

$$(y+10)(y+2)$$

$$\frac{5(y+2)+4y}{(y+10)(y+2)} = \frac{5y+10+4y}{(y+10)(y+2)}$$

$$= \boxed{\frac{9y+10}{(y+10)(y+2)}} \quad x \neq -10, -2$$