Adding & Subtracting Rational Expressions

10-18-18

Warm up: Simplify

1. $\frac{27}{27x+18} = \frac{27}{9(3x+2)} = \boxed{\frac{3}{(3x+2)}}$

2. $\frac{x^2-11x+18}{x^2+2x-8} = \frac{(x-2)(x-9)}{(x+2)(x+4)} = \boxed{\frac{x-9}{x+4}}$

Steps:

1. make one big fraction by adding/subtraction the numerator and KEEP the denominator.
   * simplify the numerator by combining like terms
   * BE CAREFUL subtracting! Subtract EACH term.

2. Simplify the fraction: GCF, factor, cancel common terms

Examples:

1. $\frac{3}{x+2} + \frac{2}{x+2} = \frac{3+2}{x+2} = \boxed{\frac{5}{x+2}}$

2. $\frac{y}{y-5} + \frac{3y}{y-5} = \frac{y+3y}{y-5} = \boxed{\frac{4y}{y-5}}$

3. $\frac{7m-2}{3m+6} - \frac{m+7}{3m+6} = \frac{(7m-2)-(m+7)}{3m+6} = \frac{6m-9}{3m+6} = \frac{3(2m-3)}{3(m+2)} = \boxed{\frac{2m-3}{m+2}}$

   * SUB. EVERY term

4. $\frac{2c+1}{5c+2} - \frac{3c-4}{5c+2} = \frac{(2c+1)-(3c-4)}{5c+2} = \boxed{\frac{-1c+5}{5c+2}}$

5. $\frac{3n+15}{n^2+7n+6} - \frac{n+3}{n^2+7n+6} = \frac{(3n+15)-(n+3)}{n^2+7n+6} = \frac{2n+12}{n^2+7n+6} = \frac{2(n+6)}{(n+6)(n+1)} = \boxed{\frac{2}{n+1}}$

Examples

6. $\frac{3k-2}{3k^2-19k+6} + \frac{1}{3k^2-19k+6} = \frac{3k-1}{(3k^2-18k)(-1k+6)} = \frac{3k-1}{3k(k-6)-1(k-6)}$

$3 \cdot 6 = 18$

$-1, -18$

$-2, -9$

$-3, -6$

$= \frac{3k-1}{(3k-1)(k-6)} = \boxed{\frac{1}{k-6}}$