

Combining Rational Expressions with Like Denominators

(Pages 656–661)

To add or subtract rational expressions with like denominators, add or subtract the numerators and then write the sum or difference over the common denominator. Remember to simplify your answer, if necessary, by dividing by the GCF.

EXAMPLES

A Find $\frac{7t}{9} - \frac{2t-1}{9}$.

$$\begin{aligned}\frac{7t}{9} - \frac{2t-1}{9} &= \frac{7t - (2t-1)}{9} \\ &= \frac{7t - 2t + 1}{9} \\ &= \frac{5t + 1}{9}\end{aligned}$$

B Find $\frac{2a}{2a-1} + \frac{2a-2}{2a-1}$.

Sometimes you must factor to simplify the sum or difference.

$$\begin{aligned}\frac{2a}{2a-1} + \frac{2a-2}{2a-1} &= \frac{2a + (2a-2)}{2a-1} \\ &= \frac{4a-2}{2a-1} \\ &= \frac{2(2a-1)}{2a-1} && \text{Factor the numerator.} \\ &= \frac{2\cancel{(2a-1)}}{\cancel{2a-1}} \\ &= 2\end{aligned}$$

PRACTICE

Find each sum or difference. Write in simplest form.

1. $\frac{9}{3m} + \frac{-12}{3m}$

2. $\frac{12x}{21} - \frac{5x}{21}$

3. $\frac{3}{x} - \frac{9}{x}$

4. $\frac{t+2}{4} - \frac{t}{4}$

5. $\frac{y+3}{2} + \frac{4y-6}{2}$

6. $\frac{2x}{8} - \frac{-14x}{8}$

7. $\frac{3c}{4c+1} + \frac{c+1}{4c+1}$

8. $\frac{7k}{k+2} - \frac{6k}{k+2}$

9. $\frac{x-3}{x-5} - \frac{2}{x-5}$

10. $\frac{3n}{2n-3} + \frac{n-6}{2n-3}$

11. $\frac{3d-2}{2} + \frac{d+4}{2}$

12. $\frac{a}{a+4} - \frac{8+a}{a+4}$

13. $\frac{2n}{5n+5} - \frac{n-1}{5n+5}$

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

15. $\frac{x-9}{x+2} - \frac{2x-12}{x+2}$



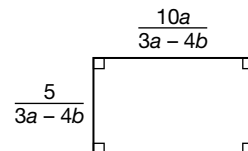
16. Standardized Test Practice Which of the following is an expression for the perimeter of the rectangle?

A $\frac{15a}{3a-4b}$

B $\frac{20a+10}{3a-4b}$

C $\frac{15a}{9a-8b}$

D $\frac{10a+5}{3a-4b}$



Answers: 1. $-\frac{x}{3} + 2$ 16. B 2. $\frac{m}{1}$ 3. $-\frac{x}{6}$ 4. $\frac{1}{2}$ 5. $\frac{5y-2}{3}$ 6. $2x$ 7. 1 8. $\frac{k+2}{k}$ 9. 1 10. 2 11. $2d+1$ 12. $-\frac{a+4}{8}$ 13. $\frac{5}{1}$ 14. 3