

12-6 Rational Expressions with Like Denominators (Pages 672–677)

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. To subtract a quantity, add its additive inverse. Remember to simplify your answer, if necessary, by dividing by the GCF.

Examples

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

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

b. Find $\frac{6y-3}{2y-1} + \frac{5y+1}{1-2y}$.

The denominator of the second expression can be rewritten. $1-2y = -(-1+2y)$ or $-(2y-1)$.

$$\begin{aligned} \frac{6y-3}{2y-1} + \frac{5y+1}{1-2y} &= \frac{6y-3}{2y-1} - \frac{5y+1}{2y-1} \\ &= \frac{6y-3-(5y+1)}{2y-1} \\ &= \frac{y-4}{2y-1} \end{aligned}$$

Practice

Find each sum or difference. Express in simplest form.

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

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

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

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

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. $\frac{x-4}{1-x} + \frac{2x-5}{x-1}$

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

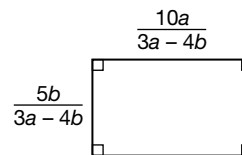
16. **Standardized Test Practice** Which of the following is an expression for the perimeter of the rectangle?

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

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

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

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



Answers: 1. $-\frac{1}{3}$ 2. $\frac{m}{-6}$ 3. $\frac{3}{x}$ 4. $\frac{x}{-6}$ 5. $\frac{2y-3}{2}$ 6. $2x$ 7. 1 8. $\frac{k+2}{k}$ 9. 1 10. $\frac{2n+6}{2n+6}$ 11. $2d+1$ 12. $-\frac{8}{8}$ 13. $\frac{5}{1}$ 14. 1 15. $-\frac{x+2}{3}$ 16. B