



**Find the sum or difference.**

1.  $\frac{8}{x+5} + \frac{x}{x+5}$

2.  $\frac{10x}{x-4} - \frac{6x}{x-4}$

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

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

5.  $\frac{3x-4}{x^2-9} + \frac{7x-3}{x^2-9}$

6.  $\frac{2x+4}{3x^2} - \frac{x-1}{3x^2}$

**Find the LCD of the rational expressions.**

7.  $\frac{6}{5x^3}, \frac{7}{15x}$

8.  $\frac{10}{x}, \frac{9x}{x+7}$

9.  $\frac{3x+1}{x-4}, \frac{x-4}{x+6}$

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

11.  $\frac{1}{x^2-5x}, \frac{8}{x^2-3x-10}$

12.  $\frac{3}{x^2+5x+4}, \frac{4x}{x^2+2x+1}$

**Find the sum or difference.**

13.  $\frac{11}{2x} + \frac{4}{7x}$

14.  $\frac{8}{3x^3} - \frac{5}{12x}$

15.  $\frac{8x}{x-5} - \frac{3x}{x+2}$

16.  $\frac{x}{6x-5} + \frac{1}{5x-3}$

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

18.  $\frac{5}{x^2} + \frac{x+3}{x-1}$

19.  $\frac{x+3}{x-1} + \frac{x+2}{x+1}$

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

21.  $\frac{1}{x^2+5x+4} - \frac{1}{x^2-16}$

- 22. Paddle Boat** You paddle a boat 8 miles upstream (against the current) and 8 miles downstream (with the current). The speed of the current is 1 mile per hour.
- Write an equation that gives the total travel time  $t$  (in hours) as a function of your average speed  $r$  (in miles per hour) in still water.
  - Find your total travel time if your average speed in still water is 3 miles per hour.
  - How much faster is your total travel time if you increased your average speed in still water to 3.5 miles per hour? Round your answer to the nearest tenth.
- 23. Bike Ride** You bike 50 miles from home. On your way back home, your average speed increases by 3 miles per hour.
- Write an equation that gives the total biking time  $t$  (in hours) as a function of your average speed  $r$  (in miles per hour) when you are biking away from home.
  - Find the total biking time if you bike away from your home at an average speed of 15 miles per hour. Round your answer to the nearest tenth.
  - How much longer is your total biking time if you bike away from your home at an average speed of 12 miles per hour?



Find the sum or difference.

1.  $\frac{x-9}{x+3} + \frac{2x+3}{x+3}$
2.  $\frac{2x-4}{x-5} - \frac{x+4}{x-5}$
3.  $\frac{3x}{2x-5} - \frac{6x-2}{2x-5}$
4.  $\frac{10x}{x-5} + \frac{x+4}{x+2}$
5.  $\frac{x+9}{x+10} - \frac{3x}{x-1}$
6.  $\frac{6x-5}{2x-3} - \frac{4x+3}{x+5}$
7.  $\frac{3x-5}{x-2} - \frac{x-1}{3x^2}$
8.  $\frac{x+6}{5x^2} + \frac{x-4}{x+2}$
9.  $\frac{x-5}{8x} - \frac{2x}{x+6}$
10.  $\frac{4x}{x^2-1} - \frac{x+1}{x^2+8x+7}$
11.  $\frac{x-2}{x^2-6x+9} - \frac{x+1}{x^2+2x-15}$
12.  $\frac{x+6}{x^2-4x-12} + \frac{x-1}{x^2+3x+2}$

Use the order of operations to write the expression as a single rational expression.

13.  $4\left(\frac{x}{x+2}\right) - 5\left(\frac{x-5}{x+1}\right)$
  14.  $6\left(\frac{4x}{x-3} + \frac{7}{x^2+5x-24}\right)$
  15.  $\frac{x-2}{x^2+10x+24} + \frac{4x}{x+1} \cdot \frac{5}{x+6}$
  16.  $\frac{x+3}{x-7} - \frac{2x^2+3x+1}{x-3} \div \frac{x^2+3x+2}{x^2-9}$
17. Suppose that  $a = 4b - b^2$  and  $b = \frac{c-5}{3c+4}$ . Write  $a$  in terms of  $c$ .
18. **In-line Skating** You in-line skate 10 miles from the beginning of a trail. On your way back, your average speed decreases by 2.75 miles per hour.
- a. Write an equation that gives the total skating time  $t$  (in hours) as a function of your average speed  $r$  (in miles per hour) when you are skating away from the beginning of the trail.
  - b. Find the total skating time if you skate away from the beginning of the trail at an average speed of 10 miles per hour. Round your answer to the nearest tenth.
  - c. How much faster is your total skating time if you skate away from the beginning of the trail at an average speed of 10.75 miles per hour?
19. **Advertisement Delivery** You and your friend plan to spend 45 minutes delivering pizza shop advertisements to houses in the shop's delivery area. You can deliver all of the advertisements on your own in two and a half hours.
- a. Write an equation that gives the fraction  $y$  of advertisements that your friend can deliver alone as a function of the time  $t$  (in minutes).
  - b. Suppose that your friend can deliver the advertisements alone in two hours and fifteen minutes. Can you deliver all of the advertisements if you and your friend work together for 45 minutes? *Explain.*