

12 CHAPTER REVIEW

12.6 Add and Subtract Rational Expressions

pp. 812–819

EXAMPLE

Find the difference $\frac{x}{x-4} - \frac{5}{x+3}$.

$$\begin{aligned} \frac{x}{x-4} - \frac{5}{x+3} &= \frac{x(x+3)}{(x-4)(x+3)} - \frac{5(x-4)}{(x+3)(x-4)} \\ &= \frac{x(x+3) - 5(x-4)}{(x-4)(x+3)} \\ &= \frac{x^2 - 2x + 20}{(x-4)(x+3)} \end{aligned}$$

Rewrite fractions using LCD, $(x-4)(x+3)$.

Subtract fractions.

Simplify numerator.

EXERCISES

Find the sum or difference.

25. $\frac{x+13}{5x-3} - \frac{9x-20}{5x-3}$

26. $\frac{5}{6a} + \frac{1}{9a^3}$

27. $\frac{6}{c+1} - \frac{c}{c^2-2c-8}$

28. **BICYCLING** You ride your bike to a beach that is 15 miles away. Your average speed on the way home is 5 miles per hour less than your average speed on the way to the beach. Write an equation that gives the total travel time t (in hours) as a function of your average speed r (in miles per hour) on the way to the beach. Then find the total travel time if you biked to the beach at an average speed of 15 miles per hour.

EXAMPLES

1, 3, 5, and 6

on pp. 812–815
for Exs. 25–28

12.7 Solve Rational Equations

pp. 820–826

EXAMPLE

Solve $\frac{2x}{x-1} + \frac{2}{3} = \frac{10}{x-1}$.

$$\frac{2x}{x-1} + \frac{2}{3} = \frac{10}{x-1}$$

Write original equation.

$$\frac{2x}{x-1} \cdot 3(x-1) + \frac{2}{3} \cdot 3(x-1) = \frac{10}{x-1} \cdot 3(x-1)$$

Multiply each expression by LCD, $3(x-1)$.

$$\frac{2x \cdot 3(\cancel{x-1})}{(\cancel{x-1})} + \frac{2 \cdot 3(x-1)}{3} = \frac{10 \cdot 3(\cancel{x-1})}{(\cancel{x-1})}$$

Divide out common factors.

$$6x + 2x - 2 = 30$$

Simplify.

$$8x - 2 = 30$$

Combine like terms.

$$x = 4$$

Solve for x .

EXERCISES

Solve the equation. Check your solution.

29. $\frac{18}{x-3} = \frac{x}{3}$

30. $\frac{4}{y+6} - 2 = \frac{20}{y^2+3y-18}$

31. $\frac{1}{z+3} - \frac{5}{6} = \frac{2}{z+3}$

EXAMPLES

1, 2, and 3

on pp. 820–821
for Exs. 29–31