

**GUIDED PRACTICE** for Examples 1 and 2

Solve the equation by cross multiplying. Check your solution(s).

1. $\frac{3}{5x} = \frac{2}{x-7}$

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

3. $\frac{1}{2x+5} = \frac{x}{11x+8}$

4. **WHAT IF?** In Example 2, suppose you have 10 ounces of jewelry silver. How much pure silver must be mixed with the jewelry silver to make sterling silver?

USING LCDS When a rational equation is not expressed as a proportion, you can solve it by multiplying each side of the equation by the least common denominator of each rational expression.

**EXAMPLE 3** TAKS PRACTICE: Multiple Choice**ELIMINATE CHOICES**

You can eliminate choice D because it yields a positive value on the left side of the equation and a negative value on the right side.

What is the solution of $\frac{3}{x} + \frac{8}{5} = -\frac{13}{x}$?

Ⓐ -10

Ⓑ -8

Ⓒ -4

Ⓓ 10

Solution

$$\frac{3}{x} + \frac{8}{5} = -\frac{13}{x}$$

Write original equation.

$$5x\left(\frac{3}{x} + \frac{8}{5}\right) = 5x\left(-\frac{13}{x}\right)$$

Multiply each side by the LCD, $5x$.

$$15 + 8x = -65$$

Simplify.

$$8x = -80$$

Subtract 15 from each side.

$$x = -10$$

Divide each side by 8.

▶ The correct answer is A. Ⓐ Ⓑ Ⓒ Ⓓ

EXAMPLE 4 Solve a rational equation with two solutions

Solve: $1 - \frac{8}{x-5} = \frac{3}{x}$

$$1 - \frac{8}{x-5} = \frac{3}{x}$$

Write original equation.

$$x(x-5)\left(1 - \frac{8}{x-5}\right) = x(x-5) \cdot \frac{3}{x}$$

Multiply each side by the LCD, $x(x-5)$.

$$x(x-5) - 8x = 3(x-5)$$

Simplify.

$$x^2 - 5x - 8x = 3x - 15$$

Simplify.

$$x^2 - 16x + 15 = 0$$

Write in standard form.

$$(x-1)(x-15) = 0$$

Factor.

$$x = 1 \text{ or } x = 15$$

Zero product property

▶ The solutions are 1 and 15. Check these in the original equation.