

5.21

Solving an Equation with Rational Expressions: Problem Type 1

• Example 1

Solve

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

Here we assume that x cannot have the value -2 or 3 .

The LCD is $(x+2)(x-3)$. Multiplying by that LCD, $(x+2)(x-3)$, we obtain

$$(x+2)(x-3)\left(\frac{4}{x+2}\right) + (x+2)(x-3)(3) = (x+2)(x-3)\left(\frac{3x}{x-3}\right)$$

Simplifying, we have

$$4(x-3) + 3(x+2)(x-3) = 3x(x+2)$$

We now clear the parentheses and proceed.

$$4x - 12 + 3x^2 - 3x - 18 = 3x^2 + 6x$$

$$3x^2 + x - 30 = 3x^2 + 6x$$

$$x - 30 = 6x$$

$$-5x = 30$$

$$x = -6$$

Note that -6 is not one of the forbidden values, -2 and 3 .

We leave the check of this solution to you.

• • • CHECK YOURSELF 1

Solve.

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

• • • CHECK YOURSELF ANSWER

1. 9.

5.21 Exercises

Name _____

Section _____

Date _____

A N S W E R S

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Solve for x .

$$1. \frac{x}{3x+12} + \frac{x-1}{x+4} = \frac{5}{3}$$

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

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

$$4. \frac{7}{x+5} - \frac{1}{x-5} = \frac{x}{x^2-25}$$

$$5. \frac{11}{x+2} - \frac{5}{x^2-x-6} = \frac{1}{x-3}$$

$$6. \frac{5}{x-2} - \frac{3}{x+3} = \frac{24}{x^2+x-6}$$