

6.4 Rational Equations

Rational Equation

- an equation that contains at least one rational expression

For example: $x = \frac{x-3}{x+1}$ and $\frac{x}{4} - \frac{7}{x} = 3$

To solve a rational equation:

- 1. Factor each denominator**
2. Identify the non - permissible values
3. Multiply both sides of the equation by the lowest common denominator
4. Solve by isolating the variable on one side of the equation
5. Check your answers



Solve: $\frac{x}{4} - \frac{7}{x} = 3$

Note:

Non - permissible values
are identified from the
original equation.

Example 1 **Solve a Rational Equation**

Solve the following equation. What values are non-permissible?

$$\frac{2}{z^2 - 4} + \frac{10}{6z + 12} = \frac{1}{z - 2}$$

Example 2 Solve the equation. What are the non-permissible values?

$$\frac{9}{y - 3} - \frac{4}{y - 6} = \frac{18}{y^2 - 9y + 18}$$

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Example 3 **Solve a Rational Equation With an Extraneous Root**
Solve the equation. What are the non-permissible values?

$$\frac{4k-1}{k+2} - \frac{k+1}{k-2} = \frac{k^2-4k+24}{k^2-4}$$

Example 4 **Solve the equation. What are the non-permissible values?**

$$\frac{3x}{x+2} - \frac{5}{x-3} = \frac{-25}{x^2-x-6}$$

Key Ideas p. 348

Assign p. 348 - 349

Questions 1(bc), 2(bc), 3(bc), 4, 5, 6, 7, 9, 11

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