Solution of Rational Equation

Rational Equation: an equation that contains one or more rational expressions. It is an equality of two ratios.
In solving rational equations:

1. Determine which values of the variable are not permissible in the expression.
2. Determine the LCD of all rational expressions.
3. Multiply both sides of the equation by the LCD.
4. Simplify the equation by removing the parenthesis and combining similar terms.
5. Solve the equation resulting from step 4.
6. Check for extraneous solution.

Extraneous solution: the value obtained in solving an equation which does not satisfy the equation

Practice Exercises

A. Determine whether the given value on the left is a solution to the rational equation or not. Write *Yes* or *No*.

1. 4; $\frac{2}{x}=\frac{6}{12}$
2. -1; $\frac{-3}{2x}=\frac{9}{6}$
3. $\frac{1}{9}$; $3x^2=\frac{1}{27}$
4. -1; $\frac{2}{x}-\frac{x}{3}=5$
5. 6; $\frac{1}{2}+\frac{1}{3}=\frac{1}{x}$

B. Solve each rational equation. If it has no solution, write *"No Solution"*.

1. $\frac{a}{3}=\frac{5}{12}$
2. $\frac{6y}{7}-\frac{y}{2}=5$
3. $\frac{1}{x}-\frac{1}{x^2}=\frac{1}{4}$
4. $\frac{x}{10}+\frac{x}{6}-\frac{x}{15}=1$
5. $\frac{2}{5}+\frac{2}{y}=1$

Problem Set

A. Determine whether the given value on the left is a solution to the rational equation or not. Write *Yes* or *No*.

1. 1; $\frac{3x}{5}=\frac{15}{25}$
2. -7; $\frac{1}{x^2}=\frac{1}{49}$
3. $\frac{-6}{7}$; $\frac{2}{3}+\frac{1}{2}=\frac{1}{x}$
4. $\frac{-1}{2}$; $\frac{1}{y}+\frac{1}{y^2}=2$
5. -2; $\frac{2}{x}+\frac{x}{4}=\frac{-3}{2}$

B. Solve each rational equation. If it has no solution, write *"No Solution"*.

1. $\frac{n}{6}-\frac{n}{4}=9$
2. $\frac{5}{4}-\frac{3}{x}=\frac{1}{2}$
3. $\frac{a+1}{3}=\frac{4}{a}$
4. $\frac{6}{x}+\frac{9}{2x}=3$
5. $3b-\frac{3}{4}=\frac{2b}{3}$

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