## 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.
- Determine the LCD of all rational expressions.
- 3. Multiply both sides of the equation by the LCD.
- Simplify the equation by removing the parenthesis and combining similar terms.
- 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; 
$$\frac{2}{x} = \frac{6}{12}$$
 3.  $\frac{1}{9}$ ;  $3x^2 = \frac{1}{27}$  5. 6;  $\frac{1}{2} + \frac{1}{3} = \frac{1}{x}$   
2.  $-1$ ;  $\frac{-3}{2x} = \frac{9}{6}$  4.  $-1$ ;  $\frac{2}{x} - \frac{x}{3} = 5$ 

$$3. \quad \frac{1}{9};$$

2. 
$$-1$$
;  $\frac{-3}{2x} = \frac{9}{6}$ 

4. 
$$-1$$
;  $\frac{2}{x} - \frac{x}{3}$ 

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

1. 
$$\frac{a}{3} = \frac{5}{12}$$

$$3\cdot \frac{1}{x}$$

$$5. \quad \frac{2}{5} + \frac{2}{y} =$$

$$2. \quad \frac{6y}{7} - \frac{y}{2}$$

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

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

1. 1; 
$$\frac{3^{x}}{5} = \frac{15}{25}$$

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

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

2. 
$$-7$$
;  $\frac{1}{x^2} = \frac{1}{4}$ 

4. 
$$\frac{-1}{2}$$
;  $\frac{1}{y} + \frac{1}{y^2} = 2$ 

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

1. 
$$\frac{n}{6} - \frac{n}{4} =$$

$$3. \quad \frac{a+1}{3} = \frac{2}{3}$$

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

2. 
$$\frac{5}{4} - \frac{3}{x} = \frac{1}{2}$$

$$4. \quad \frac{0}{x} + \frac{9}{2x} = 3$$

## 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.
- Multiply both sides of the equation by the LCD.
- Simplify the equation by removing the parenthesis and combining similar terms.
- 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; 
$$\frac{2}{x} = \frac{6}{12}$$

3. 
$$\frac{1}{9}$$
;  $3x^2 = \frac{1}{27}$ 

$$. 6; \frac{1}{2} + \frac{1}{3} = \frac{1}{x}$$

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

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

1. 
$$\frac{a}{3} = \frac{5}{12}$$

$$3. \quad \frac{1}{x} - \frac{1}{x}$$

5. 
$$\frac{2}{5} + \frac{2}{y} = 3$$

$$2. \quad \frac{6y}{7} - \frac{y}{2} = 5$$

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

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

1. 1; 
$$\frac{3^{X}}{5} = \frac{15}{25}$$

3. 
$$\frac{-6}{7}$$
;  $\frac{2}{3}$ 

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

2. 
$$-7$$
;  $\frac{1}{X^2} = \frac{1}{49}$ 

4. 
$$\frac{-1}{2}$$
;  $\frac{1}{y} + \frac{1}{y^2}$ 

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

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

$$\frac{a+1}{2}$$

5. 
$$3b - \frac{3}{4} =$$

2. 
$$\frac{5}{4} - \frac{3}{x} = \frac{1}{2}$$

$$\frac{6}{x} + \frac{9}{2x} = 3$$

## 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.
- 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.
- 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; 
$$\frac{2}{x} = \frac{6}{12}$$

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

5. 6; 
$$\frac{1}{2} + \frac{1}{3} = \frac{1}{3}$$

2. 
$$-1$$
;  $\frac{-3}{2x} = \frac{9}{6}$ 

1. 
$$\frac{a}{3} = \frac{5}{12}$$

$$6y \quad y$$

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

$$5. \quad \frac{2}{5} + \frac{2}{y} = 1$$

2. 
$$\frac{6y}{7} - \frac{y}{2} = 1$$

4. 
$$\frac{x}{10} + \frac{x}{6} - \frac{x}{15} =$$

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

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

4. 
$$\frac{7}{2}$$
;  $\frac{3}{v} + \frac{1}{v^2} =$ 

1. 
$$\frac{n}{6} - \frac{n}{4} = 0$$

3. 
$$\frac{a+1}{3} = \frac{1}{3}$$

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

$$2. \quad \frac{5}{4} - \frac{3}{x} = \frac{1}{2}$$

$$4. \quad \frac{6}{x} + \frac{9}{2x} = 1$$

### 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.
- Determine the LCD of all rational expressions.
- Multiply both sides of the equation by the LCD.
- Simplify the equation by removing the parenthesis and combining similar terms.
- 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; 
$$\frac{2}{x} = \frac{6}{12}$$

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

5. 6; 
$$\frac{1}{2} + \frac{1}{3} = \frac{1}{3}$$

2. 
$$-1$$
;  $\frac{-3}{2x} = \frac{9}{6}$ 

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

1. 
$$\frac{-}{3} \frac{-}{12}$$
2. 
$$\frac{6y}{-} \frac{y}{-} =$$

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

$$\frac{4}{x} = 1$$

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

1. 1; 
$$\frac{3x}{5} = \frac{15}{25}$$

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

$$1. \quad \frac{n}{6} - \frac{n}{4} = 9$$

$$3. \quad \frac{a+1}{3} = \frac{4}{6}$$

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

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