



No Solution

Section

2.7

Solve the rational equation and identify extraneous solutions.

$$\frac{x-3}{x} + \frac{3}{x+2} + \frac{6}{x^2+2x} = 0$$

We need to find a LCD. Consider all three denominators.

$$\left(\frac{(x+2)}{(x+2)}\right)\frac{x-3}{x} + \left(\frac{x}{x}\right)\frac{3}{x+2} + \frac{6}{x(x+2)} = 0$$

Factor the denominator both sides to find the LCD.

$$\frac{x^2-x-6}{x(x+2)} + \frac{3x}{x(x+2)} + \frac{6}{x(x+2)} = 0$$

Next we need to multiply to get common denominators.

$$\frac{x^2+2x}{x(x+2)} = 0$$

$$x^2+2x = 0$$

$$x(x+2) = 0$$

$$x = 0, \quad x = -2$$

When a fraction is equal to zero, the numerator must be equal to zero.

SO... NO Solution!

Checking for extraneous solutions.

$$\frac{2x}{x-1} + \frac{1}{x-3} = \frac{2}{(x-3)(x-1)}$$

$$x = -\frac{1}{2}, \quad \cancel{x=3}$$

$$D: \mathbb{R}, x \neq 1, 3$$

$$\frac{2(3)}{(3)-1} + \frac{1}{\underset{\nearrow}{3}-\underset{\nwarrow}{3}} = \frac{2}{(\underset{\nearrow}{3}-\underset{\nwarrow}{3})(3-1)}$$

ZERO in the denominator. This is not allowed. It makes the fraction undefined.

2.7 Solving equations in one variable.

Solve the system of equations.

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

$$2. \quad x + \frac{1}{x-4} = 0$$

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

$$4. \quad \frac{x-3}{x} + \frac{3}{x+2} + \frac{6}{x^2 + 2x} = 0$$

Homework

Complete the asymptote/hole worksheet.

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