

4.5: Solve Rational Equations

EX 1) Solve: $\frac{x-8}{x-3} = \frac{x+5}{x+3}$ $x \neq \pm 3$

$$(x-8)(x+3) = (x-3)(x+5)$$

$$x^2 + 3x - 8x - 24 = x^2 + 5x - 3x - 15$$

$$\begin{array}{r} -5x - 24 = 2x + 15 \\ -2x + 24 \quad -2x + 24 \end{array}$$

$$\begin{array}{r} -7x = 9 \\ \hline -7 \quad -7 \end{array}$$

$$x = -\frac{9}{7}$$

EX 2) Solve: $\frac{x^2}{x-9} = \frac{81}{x-9}$ $x \neq 9$

$$x^2(x-9) = 81(x-9)$$

$$\pm \sqrt{x^2} = \pm \sqrt{81}$$

$$x = \pm 9$$

$$x = -9$$

Ex 3) Solve: $\frac{5k}{k+2} + \frac{2}{k} = 5$

LCD: $(k+2)k$

$k \neq -2, 0$

$$\frac{5k}{k+2} \cdot \cancel{(k+2)}k + \frac{2}{k} \cdot \cancel{(k+2)}k = 5 \cdot (k+2)k$$

$$\cancel{5k^2} + \cancel{2k} + 4 = \cancel{5k^2} + 10k - 2k$$

$$4 = \frac{8k}{8}$$

$$k = \frac{1}{2}$$