

$$\textcircled{1} \quad \frac{-3}{x-7} = \frac{5}{x+7}$$

SOLVING RATIONAL EQUATIONS

STEP 1: FACTOR DENOMINATORS

STEP 2: FIND LCM AND MULTIPLY EVERYTHING BY IT

$$\cancel{(x-7)}\cancel{(x+7)}\left(\frac{-3}{\cancel{x-7}}\right) = \cancel{(x-7)}\cancel{(x+7)}\left(\frac{5}{\cancel{x+7}}\right)$$

$$-3(x+7) = 5(x-7)$$

STEP 3: SOLVE FOR X

$$-3x - 21 = 5x - 35$$

$$-3x - 5x = -35 + 21$$

$$-8x = -14$$

$$\frac{-8x}{-8} = \frac{-14}{-8}$$

$$x = \frac{7}{4}$$

STEP 4: SEMI-CHECK ANSWER

$$\textcircled{2} \quad \frac{2}{x+3} + 7 = \frac{1}{x+3}$$

$$\cancel{(x+3)}\left(\frac{2}{\cancel{x+3}}\right) + 7(x+3) = \cancel{(x+3)}\left(\frac{1}{\cancel{x+3}}\right)$$

$$2 + 7(x+3) = 1$$

$$2 + 7x + 21 = 1$$

$$7x + 23 = 1$$

$$7x = 1 - 23$$

$$7x = -22$$

$$\frac{7x}{7} = \frac{-22}{7}$$

$$x = \frac{-22}{7}$$

$$\textcircled{3} \quad \frac{5}{x-1} - \frac{2}{x-9} = \frac{10x-2}{x^2-10x+9} \quad \text{PSD}$$

$$\frac{5}{x-1} - \frac{2}{x-9} = \frac{10x-2}{(x-1)(x-9)}$$

$$\cancel{(x-1)}\cancel{(x-9)}\left(\frac{5}{\cancel{x-1}}\right) + \cancel{(x-1)}\cancel{(x-9)}\left(\frac{-2}{\cancel{x-9}}\right) = \cancel{(x-1)}\cancel{(x-9)}\left(\frac{10x-2}{\cancel{(x-1)}\cancel{(x-9)}}\right)$$

$$5(x-9) - 2(x-1) = 10x-2$$

$$5x - 45 - 2x + 2 = 10x - 2$$

$$3x - 43 = 10x - 2$$

$$3x - 10x = -2 + 43$$

$$-7x = 41$$

$$\frac{-7x}{-7} = \frac{41}{-7}$$

$$x = \frac{-41}{7}$$