Friday, March 30, 2018 1:12 PM

Solve rational Equations

Recall 8.5 in book.

$$\frac{x-4}{4} + \frac{x}{3} = 6 \qquad LCD = 12$$

$$3x - 12 + 4x = 72$$

Solve from Alg 1.

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

$$3x + 3 - 4x^2 = -4x^2 + 4x$$

$$-x + 3 = 0$$

$$x = 3$$

$2(3) = 6$ ✓

$3 + 1 = 4$ ✓

You must check this answer in the original denominators!

$$\frac{2m}{m-1} + \frac{m-5}{m^2-1} = 1$$

LCD = $(m+1)(m-1)$

$2m^2 + 2m + m - 5 = m^2 - 1$

$1m^2 + 3m - 4 = 0$

$(x+4)(x-1) = 0$

$x = -4$ $\quad x = 1$

Check!!!

$-4-1=-5$ ✓

$1^2-1=0$ ✗ NO! NO! NO!

Extraneous Solution

Kerry can do her job in 4 hours. Sam can do the same job in 2 hours. How long will it take to complete the job if they work together?

$$\frac{1}{\text{alone}} + \frac{1}{\text{alone}} = \frac{1}{\text{together}}$$

4x $\quad$ 2x $\quad$ 4x $\quad$ LCD

$$\frac{1}{4} + \frac{1}{2} = \frac{1}{x} \qquad 4x$$

$$1x + 2x = 4$$

$$3x = 4$$

$$x = 4/3 = 1\frac{1}{3}$$

It will take Kerry and Sam $1\frac{1}{3}$ hours to complete the job together

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It take Sam 2 more hours than Kerry to do a job. Together they complete the job in 7 hours. How long will it take each, working alone, to do the job?

K	S	Together
$\frac{1}{x}$	$\frac{1}{x+2}$	$\frac{1}{7}$
K 0.42	S 2.42	

LCD $x(x+2)(7)$

$$7x + 14 + 7x = x^2 + 2x$$

$$x^2 \ldots$$

$(x+2)(7)$

$$x^2 - 12x - 14 = 0$$

$$\frac{12 \pm \sqrt{144 - 4(1)(-14)}}{2}$$

$$\frac{12 \pm \sqrt{200}}{2}$$

$= 13.07$

~~$.424$~~

It takes Kerry 13.07 hours and Sam 15.07 hours.