MATH 0270/1314 COLLEGE ALGEBRA Week 10 Tuesday 4/9/19

THREE TYPES OF RESULTS FROM A LINEAR EQUATION.

(1). ONE (UNIQUE) SOLUTION
(2) NO SOLUTION
} CONDITIONAL EQUATION

(3) ALL REAL NUMBERS ARE SOLUTIONS - IDENTITY EQUATION

EQUATIONS W/ FRACTIONS

step 1: cross multiply if a fraction = a fraction.

step 2: proceed as usual to solve the linear equation

(step 3: plug in your answer to original expression to check).

e.g. $\frac{100-4x}{3} = \frac{5x+6}{4} + 6$

step 1: Find the least common multiple (common denominator) of the denominators

☆ if you struggle to find the least common multiple, just multiply all the denomators and use the "common multiple", it works just find

step 2: Multiply each term by the (least) common multiple

LCM = 3·4 = 12

$\frac{100-4x}{3} \cdot \frac{12^4}{1} = \frac{5x+6}{4} \cdot \frac{12^3}{1} + 6 \cdot 12$

this step → shouldn't have fractions any more

$4(100-4x) = 3(5x+6) + 72$

$400 - 16x = 15x + 18 + 72$

$400 - 16x = 15x + 90$

$400 = 15x + 16x + 90$

$400 - 90 = 31x$

$310 = 31x$

$\boxed{10 = x}$

e.g. $10 - \frac{13}{x} = 4 + \frac{5}{x}$

LCM = x

$10x - \frac{x}{1} \cdot \frac{13}{x} = 4x + \frac{5}{x} \cdot \frac{x}{1}$

$10x - 13 = 4x + 5$

$10x - 4x - 13 = 5$

$6x = 5 + 13 \Rightarrow 6x = 18 \Rightarrow \boxed{x = 3}$

(1) $7x-3=12+2x$.

$7x-2x-3=12$

$5x=12+3$

$5x=15$

$\boxed{x=3}$

(2) $5x-7=2x+3(x-3)+2$.

$5x-7=2x+3x-9+2$.

$5x-7=5x-7$. → when you got to one side being the same as the other side, you have an identity, and you may conclude directly from there that everything works.

$(0=0.)$ identical.

Solutions can be any real numbers

(3) $3x+2x+6=5(x+2)$

$5x+6=5x+10$.

$6=10$. → false statement

There's no solution.

(4). $\frac{x}{3}+5=\frac{x}{2}+4$

LCM = 6.

$\frac{x}{3}\cdot\frac{6}{1}+5\cdot6=\frac{x}{2}\cdot\frac{6}{1}+4\cdot6$.

$2x+30=3x+24$

$2x-3x+30=24$

$-x+30=24$

$-x=24-30$

$-x=-6$

$\boxed{x=6}$

$30=3x-2x+24$

$30=x+24$

$30-24=x$

$\boxed{6=x}$ ✓