Solving Linear Equations

General procedure for solving 1st degree equations

1. Clear away fractions and decimals
2. Simplify equations to the form **ax + b = cx + d**
3. Combine the remaining x terms using the additive property of equality (move the desired x to the other side using "opposite side-opposite operation")
4. Undo the addition/subtraction with the remaining x term, using addition propery of equality, therefore isolating the x term
5. Undo the coefficient with x, using the multiplication property of equality

Example:

$\frac{x-5}{3} = \frac{2x+1}{2} - 2$ *mult eq by 6 to clear the fraction (mult. prop of equality)*

Result:

$2(x-5) = 3(2x + 1) - 6(2)$ note: *den. cancelled*

$2x-10=6x+3-12$ *simplify*

$2x - 10 = 6x-9$

$-6x \quad -6x$ *move 6x by subtracting from both sides: (subtr. prop of equality)*

$-4x - 10 = -9$ *move –10 by adding to both sides add prop of equality*

$+10 \quad +10$

$-4x = \frac{1}{-4}$ *move –4 by dividing by the coefficient (Div. prop of equality)*

$x = -\frac{1}{4}$

Practice:

$4x + 14 = 6x + 8$

$-3(2w-7) - 10 = 9 - 2(5w+4)$

$\frac{2+h}{9} + \frac{h-1}{3} = \frac{1}{3}$

$-3x - 4.7 = 11.8$