6.3 SOLVING MULTI-STEP LINEAR EQUATIONS

Name:_____ Block_____

In this section we are going to look at ***more complicated examples*** of linear equations that involve using ***multiple steps*** and ***all the techniques we've learnt so far*** to find a solution.

<u>The aim of the game:</u>
Use the algebraic techniques we have been working with in this unit to **isolate the variable on <u>one side</u>** of the equation and the **numeric terms on the <u>other side</u>** of the equation

A) VARIABLES ON BOTH SIDES

Many multi-step equations contain variables on _____ sides.

So how do we decide which to isolate? COLLECT LIKE TERMS!

Move ***all variables to the same side*** and all *<u>constant (numbers only) terms to the other side</u>*!

EXAMPLE:

a) $3m + 3 = 7m + 12$

b) $-5m + 20 = -7m - 15$

120. Solve. 5m+1=3m-7

121. Solve. 13m+5=11m-7

124. 2m+3=-7m-15

122. Solve. 2m+10=7m-15

123. Solve. -3m+18=6m-6

125. Solve. 2m+20=-7m-15

B) BRACKETS, FRACTIONS VARIABLES ON BOTH SIDES...OH MY!

Now that the equations are getting more complex, it may helpful to review these steps.

- Eliminate Fractions by multiplying both sides by the common denominator.
- Eliminate brackets by Expanding.
- Collect Like Terms on each side of the equal sign.
- Get variables to same side by Subtracting or Adding variables to each side.
- Get constants to same side by Subtracting or Adding constants to each side.
- Isolate the variable by Dividing both sides by the coefficient.

EXAMPLE:

a) $2(6w+2) = 4w - 3$

b) $\frac{2}{3} + \frac{5}{6}c = \frac{1}{3}c - \frac{1}{6}$

c) $2(m-1) + \frac{5m}{2} = \frac{2}{3}(m+3)$

142. Solve. 4(m-1)-6m=-10(2m-1)-1

143. Solve. 3(m-1)+6m=5(2m-1)+1

158. $\frac{5m}{2} + \frac{m}{3} = \frac{1}{2}m + 5$

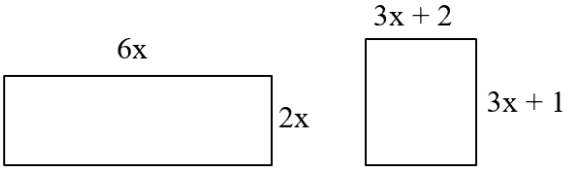
160. $m - \frac{m}{3} = \frac{1}{4}m + 4$

C) MULTI-STEP LINEAR EQUATION WORD PROBLEMS

Example 1:

The rectangles pictured have the ***same perimeter.***

a) Determine the value of x that makes this true.



b) What are the dimensions of each rectangle?

Example 2:

Ted and Wayne are both travelling across British Columbia. Ted drives at an average speed of 90 km/h. Wayne left 30 minutes later and drove at an average speed of 100 km/h.

a) How long did it take for Wayne to catch up with Ted?

b) How far have they driven to this point?

Homework	Required	Extra Practice	Extension
Assignment #6.3 231 - 235	#1, 2, 4ace, 5acef, 6ace, 7, 10abc, 11, 13, 14, 15, 16, 17, 18, 20, 26a	#3, 4bdf, 5bd, 6bd, 8, 9, 10d, 12, 19, 21, 22, 26b	23, 24, 25