

HW # 5-7
 Number and Inequality Word Problems
 Day II

- ★ 1) If four times a number is decreased by 10, the result is the same as when 9 times the number is diminished by 50. Find the number.

L	E	S	C
Let $x =$ the #	$4x - 10 = 9x - 50$ $\begin{array}{r} -4x \\ \hline -10 = 5x - 50 \\ +50 \\ \hline 40 = 5x \\ \underline{ 5} \\ x = 8 \end{array}$	The # is 8	$4(8) = 32$ $32 - 10 = 22$ $9(8) = 72$ $72 - 50 = 22$ $22 = 22$

- ★ 2) Ace Construction built 5 less than twice the number of houses that Ben's Construction built. If the total number of houses built by both firms was 115, how many did each build?

L	E	S	C
Let $x =$ # of houses Ben's company built $2x - 5 =$ # of houses Ace's company built	$x + 2x - 5 = 115$ $3x - 5 = 115$ $\begin{array}{r} +5 \\ \hline 3x = 120 \\ \underline{ 3} \\ x = 40 \end{array}$ $2x - 5 = 75$	Ben's construction built 40 houses + Ace's construction built 75 houses	$40(2) = 80$ $80 - 5 = 75$ $40 + 75 = 115$ $115 = 115$

- ★ 3) One number is four more than another number. If four times the smaller number is decreased by twice the larger number, the result is 12. Find both numbers.

L	E	S	C
Let $x =$ the smaller # $x + 4 =$ the larger #	$4(x) - 2(x+4) = 12$ $4x - 2x - 8 = 12$ $2x - 8 = 12$ $\begin{array}{r} +8 \\ \hline 2x = 20 \\ \underline{ 2} \\ x = 10 \end{array}$ $x + 4 = 14$	The smaller # is 10 & the larger # is 14	$10 + 4 = 14$ $4(10) = 40$ $2(14) = 28$ $40 - 28 = 12$

★ Binomials must always be put in ()

4) Three times a number increased by 8 does not exceed 40 more than the number. Find the greatest possible value of the number.

L	I E	S	C
let x = the #	$3x + 8 \leq x + 40$ $\begin{array}{r} -x \quad -x \\ \hline 2x + 8 \leq 40 \\ -8 \quad -8 \\ \hline 2x \leq 32 \\ \frac{2x}{2} \leq \frac{32}{2} \\ \boxed{x \leq 16} \end{array}$	the greatest possible value is 16	$3(16) = 48$ $48 + 8 = 56$ $\frac{56}{16 + 40} = 56$ $56 \leq 56 \checkmark$ <hr/> $3(17) = 51$ $51 + 8 = 59$ $17 + 40 = 57$ $59 \not\leq 57$

5) The larger of two numbers is 12 more than twice the smaller. The larger number is 36. What is the smaller number?

L	E and sent	S	C
let x = the smaller # 2x + 12 = the larger #	$2x + 12 = 36$ $\begin{array}{r} -12 \quad -12 \\ \hline 2x = 24 \\ \frac{2x}{2} = \frac{24}{2} \\ \boxed{x = 12} \\ 2x + 12 = 36 \end{array}$	the smaller # is 12	$2 \cdot 12 = 24$ $12 + 24 = 36 \checkmark$ $\boxed{36}$

6) The larger of two numbers is three times the smaller number. If the larger number is diminished by 30, the result is the sum of the smaller number and 10. Find both numbers.

L	E and sent	S	C
let x = the smaller # 3x = the larger #	$3x - 30 = x + 10$ $\begin{array}{r} -x \quad -x \\ \hline 2x - 30 = 10 \\ +30 \quad +30 \\ \hline 2x = 40 \\ \frac{2x}{2} = \frac{40}{2} \\ \boxed{x = 20} \\ 3x = 60 \end{array}$	the smaller # is 20 + the larger # is 60	$3(20) = 60 \checkmark$ $60 - 30 = 30 \checkmark$ $20 + 10 = 30 \checkmark$

7) The larger of two rock collections has twice the number of specimens of the smaller collection. If the smaller number is increased by 4, the result is 6 less than the larger number. Find the number of rocks in each collection.

L	E	S	C
<p>Let $x =$ the # of rocks in the smaller collection $2x =$ the # of rocks in the larger collection</p>	$x + 4 = 2x - 6$ $\begin{array}{r} x + 4 \\ -x \quad -6 \\ \hline 4 = x - 6 \\ +6 \quad +6 \\ \hline x = 10 \\ 2x = 20 \end{array}$	<p>There are 10 rocks in the smaller collection & 20 rocks in the larger.</p>	$2(10) = 20$ $\frac{10 + 4 = 14}{20 - 6 = 14}$

8) The members of a club agree to buy at least 250 tickets for a theater party. If they expect to buy 80 fewer orchestra tickets than balcony tickets, what is the least number of balcony tickets they will buy?

L	I	S	C
<p>Let $x =$ the # of balcony tickets they will buy $x - 80 =$ the # of orchestra tickets they will buy</p>	$x + x - 80 \geq 250$ $2x - 80 \geq 250$ $\begin{array}{r} 2x - 80 \\ +80 \quad +80 \\ \hline 2x \geq 330 \\ \frac{2x}{2} \geq \frac{330}{2} \\ x \geq 165 \\ x - 80 \geq 85 \end{array}$	<p>The least # of balcony tickets they will buy is 165</p>	$165 + 85 = 250$ $250 \geq 250 \checkmark$ $165 - 80 = 85 \checkmark$ $160 + 80 = 240$ $240 \not\geq 250$ <p>2nd # needs to correspond to new 1st #</p>

9) Mrs. Scott decided that she would spend no more than \$120 to buy a jacket and a skirt. If the price of the jacket was \$20 more than 3 times the price of the skirt, find the highest possible price of the skirt.

L	I	S	C
<p>Let $x =$ the price of the skirt $3x + 20 =$ the price of the jacket</p>	$x + 3x + 20 \leq 120$ $4x + 20 \leq 120$ $\begin{array}{r} 4x + 20 \\ -20 \quad -20 \\ \hline 4x \leq 100 \\ \frac{4x}{4} \leq \frac{100}{4} \\ x \leq 25 \\ 3x + 20 \leq 95 \end{array}$	<p>the highest possible price of the skirt is no more than \$25</p>	$25 + 95 = 120$ $120 \leq 120$ $25(3) = 75$ $75 + 20 = 95$ $30 + 110 = 140$ $140 \not\leq 120$ <p>must correspond</p> $30(3) = 90$ $90 + 20 = 110 \checkmark$