

Warm Up

9/5/18

***COPY DOWN THE PROBLEMS**

1. The sum of Avery and Becca's ages is 58 years. Avery is two more than 3 times the age of Becca. Find their ages.

$x = \text{Becca's age}$
 $2 + 3x = \text{Avery's age}$
 $2 + 3(14)$
 $2 + 42$
 44

14 yr.
44 yr

$$(x) + (2 + 3x) = 58$$

$$4x + 2 = 58$$

$$\begin{array}{r} -2 \quad -2 \\ \hline 4x = 56 \\ \frac{4}{4} \quad \frac{4}{4} \\ x = 14 \end{array}$$

2. Five times the sum of a number and 16 is 65. Find the number.

$$5(x + 16) = 65$$

$$5x + 80 = 65$$

$$\begin{array}{r} -80 \quad -80 \\ \hline 5x = -15 \\ \frac{5}{5} \quad \frac{5}{5} \\ x = -3 \end{array}$$

$x = -3$

3. Solve:

$$\begin{array}{r} x - 15 = 4 \\ \quad -3 \quad -3 \\ \hline x - 18 = -12 \\ \quad +18 \quad +18 \\ \hline x = 6 \end{array}$$

$x = 6$

Solving Inequalities

Solving Inequalities

Follow the same steps as solving equations

***Special Rule:** Flip the inequality symbol when multiplying or dividing by a negative

$$16x + 20 - 9x > -15$$

$$\begin{array}{r} 7x + 20 > -15 \\ -20 \quad -20 \\ \hline 7x > -35 \\ \frac{7x}{7} > \frac{-35}{7} \end{array}$$

$$x > -5$$

5, 9 bil., 25, 0
-4

$$-5(2x + 7) - 1(4x - 3) \geq -88$$

$$\underline{-10x} \underline{-35} \underline{-4x} \underline{+3} \geq -88$$

$$\begin{array}{r} -14x - 32 \geq -88 \\ +32 \quad +32 \\ \hline \end{array}$$

$$\begin{array}{r} -14x \geq -56 \\ \hline \end{array}$$

$$x \leq 4$$

$$3, 2, -5, 4, -420$$

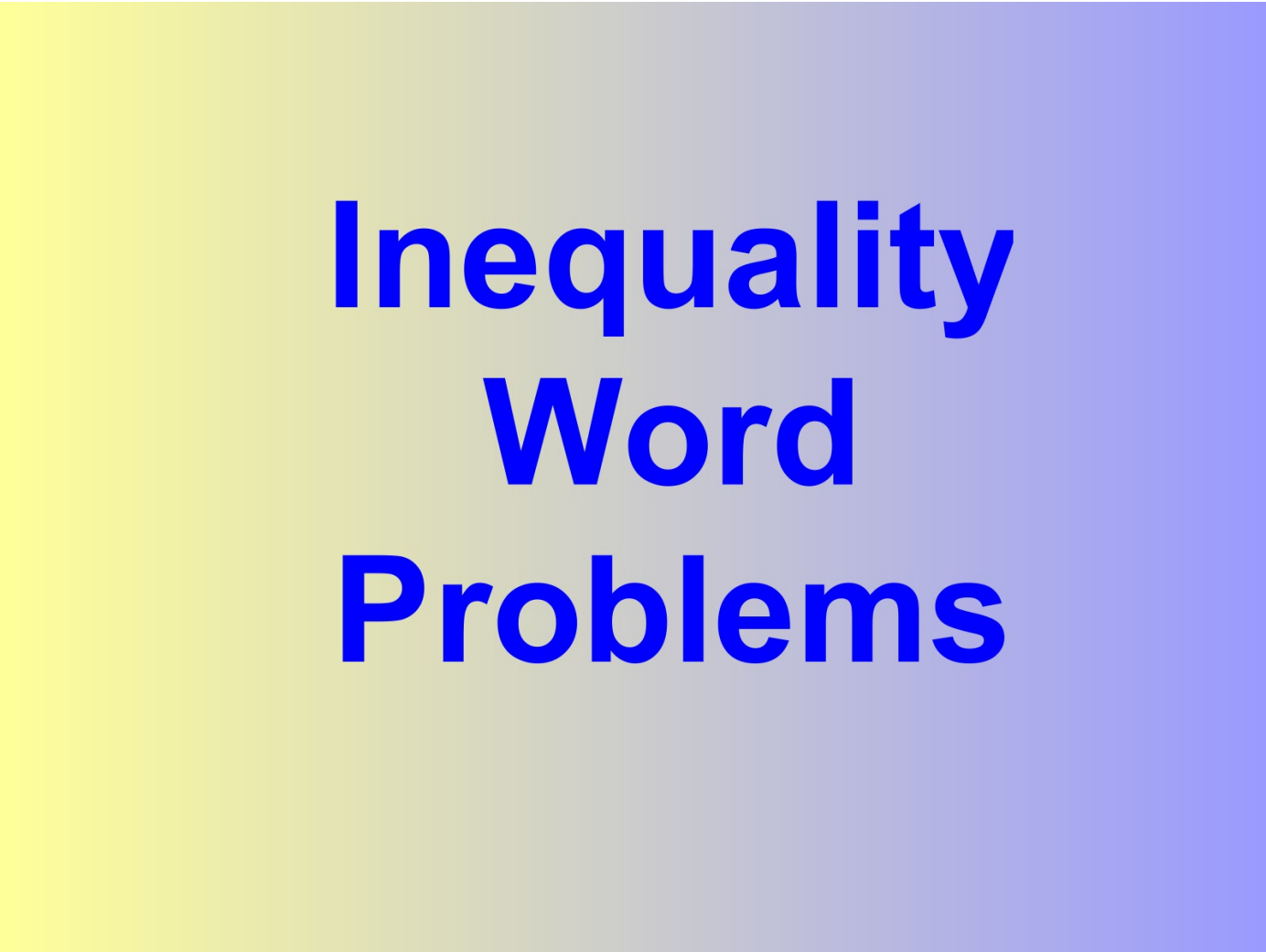
$$(6) \frac{1}{3}x + 12 < 4x - \frac{1}{2} \quad (6)$$

$$2x + 72 < 24x - 3$$

$$\begin{array}{r} 2x + 72 < 24x - 3 \\ -72 \quad \quad -72 \\ \hline 2x < 24x - 75 \\ -24x \quad -24x \\ \hline \end{array}$$

$$\begin{array}{r} -22x < -75 \\ \hline -22 \quad \quad -22 \end{array}$$

$$\boxed{x > \frac{75}{22}}$$



**Inequality
Word
Problems**

Words for each inequality symbol

< (less than)	= (equal)	> (greater than)
is less than	is / are / will be /only	more than
is under	is the same as	above
is below	that is equal to	over
shorter / smaller than	exactly	greater / larger than
fewer than	half (= .5* or ½ *)	exceeds / increased
is lower than		longer than
beneath		is higher than
a better deal		

≤ (less than or equal to)	≠ (not equal to)	≥ (greater than or equal to)
at most	is not equal to	at least
maximum	is not the same as	minimum
bottom	is different / differs from	top
is no more than		is no less than

Translate the verbal sentences into an algebraic inequality.

- 1) x is at most 50

$x \leq 50$

- 2) The sum of 5x and 2x is at least 70

$5x + 2x \geq 70$ $7x \geq 70$

Check Understanding

- 3) The maximum value of $4x - 6$ is 54.

$4x - 6 \leq 54$

- 4) 6 less than a number is greater than 4

$x - 6 > 4$

Write an inequality and solve the problem algebraically.

- 1) The product of nine and x is greater than six more than the product of three and x.

$$\begin{array}{r} 9x > 6 + 3x \\ -3x \quad \quad -3x \\ \hline \end{array}$$

$$\frac{6x}{6} > \frac{6}{6}$$

$x > 1$

- 2) Joan needed \$100 to buy a graphing calculator for her math class. Her neighbor will pay her \$5 per hour to babysit and her father gave her \$10 for cleaning her room. What is the minimum amount of hours she will need to babysit in order for her to buy her calculator?

$x = \# \text{ of hrs.}$

$$5x + 10 \geq 100$$

$$\begin{array}{r} -10 \quad -10 \\ \hline \end{array}$$

At least
18 hrs

$$\frac{5x}{5} \geq \frac{90}{5} \quad x \geq 18$$

- 3) The dance committee hired a DJ for the fall dance. The DJ charges \$125 per hour plus \$55 for an assistant. The committee wants to keep the total cost under \$600. What is the maximum amount of hours the DJ will play at the dance?

$x = \text{hrs.}$

$$125x + 55 \leq 600$$

$$\begin{array}{r} -55 \quad -55 \\ \hline \end{array}$$

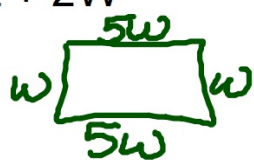
At most
4 hrs

$$\frac{125x}{125} \leq \frac{545}{125}$$

$$x \leq 4.36$$

4) The length of a rectangle is 5 times its width. The perimeter of the rectangle is at most 108 meters. Find the greatest possible dimensions of this rectangle. $P = 2L + 2W$

$w = \text{width}$
 $5w = \text{length}$



$$\frac{2w \leq 108}{12} \quad \frac{108}{12}$$

$$w \leq 9 \text{ m}$$

width is at most 9 m
length is at most 45 m

5) The cost per month of making n number of wooden toys is $C = 3n + 30$. The income from selling n toys is $I = 6n$. How many toys must the company make to get a profit ($I > C$)?