

Key Words & Phrases

ADD	SUBTRACT	MULTIPLY	DIVIDE
Add	*subtracted from	Multiplied by	Divide
Sum	Difference	Of	Quotient
*More than	*Less than	Product	Divided equally
Increased by	Decreased by	Times	Per
Exceeds	Diminished by	Double	Ratio of
In all	Minus	Twice	
Total	Fewer	Triple	
Plus	Reduced by		

** a number: x

** is or is equal to : $=$

* Be careful using; more than, less than and subtracted from, because it reverses the order.

I. Use mathematical symbols to translate the following verbal phrases into algebraic expressions

1) 2 more than a number

$$x + 2$$

2) w less than 3

$w = \text{sign}$

$$3 - w$$

3) six decreased by 5 times a number

$$6 - 5x$$

4) the product of $5r$ and s

$$5r \cdot s$$

$$(5rs)$$

5) 25, diminished by 4 times n

$$25 - 4n$$

6) twice x , decreased by 10

$$2x - 10$$

7) five less than three times a number

$$3x - 5$$

8) the sum of t and u , divided by 6

$$\frac{(t+u)}{6} \quad (t+u) \div 6$$

9) three-fourths of a number

$$\frac{3}{4}x$$

10) seven times a number, increased by 4

$$7x + 4$$

II. Translate the following verbal phrases into algebraic equations

1) A number minus 26 is 18

$$x - 26 = 18$$

2) 7 more than 2 times a number is 13

$$2x + 7 = 13$$

3) The product of 5 and a number is 10

$$5x = 10$$

4) two less than three times a number is 28

$$3x - 2 = 28$$

5) one-sixth of a number is 66

$$\frac{1}{6}x = 66$$

6) A number increased by 83 is 105.

$$x + 83 = 105$$

III. Legend Practice:

1) The cost of a mountain bike is 5 times the cost of a skateboard. If the skateboard costs x dollars, represent the cost of the mountain bike.

let $5x =$ the cost of the mountain bike

2) The number of kilometers traveled by a bus is represented by x . If a train traveled 200 kilometers farther than the bus, represent the number of kilometers traveled by the train.

let $x + 200 =$ the # of km traveled by the train

IV. Algebra word problems

1) Which algebraic equation represents "when a number is tripled and then increased by 2, the result is 17?"

a) $3n = 17 + 2$

b) $3(n + 2) = 17$

c) $3n + 2 = 17$

d) $n + 3 \times 2 = 17$

2) "Twice y , increased by 7 is equal to eight times y , less than 37" is represented by the algebraic equation:

a) $2(y + 7) = 37 - 8y$

b) $2y + 7 = 37 - 8y$

c) $2y + 7 = 8(37 - y)$

d) $2(y + 7) = 8(37 - y)$

V. Inequality word problems

***Frequently, word problems involve translating an English sentence into an inequality. The following is a list of key words to help you in writing your inequalities.

$$x > 12$$

A number is more than 12.
 A number exceeds 12.
 A number is greater than 12.
 A number is over 12.

$$x \geq 12$$

A number is at least 12.
 A number has a minimum value of 12.
 A number is not less than 12.
 A number is not under 12.

$$x < 12$$

A number is less than 12.
 A number is under 12.

$$x \leq 12$$

A number is at most 12.
 A number has a maximum value of 12.
 A number is not greater than 12.
 A number does not exceed 12.
 A number is not more than 12.

Ex: at least/min
 of 85 to
 be on
 the honor roll

Ex: at most/
 the
 \$20 to spend
 on a gift!

VI. Translate each sentence into an algebraic inequality

1) y is greater than or equal to 4.

$$y \geq 4$$

2) x is less than or equal to 15

$$x \leq 15$$

3) x is more than 50

$$x > 50$$

4) A number is under 15

$$x < 15$$

5) x is at most 50.

$$x \leq 50$$

6) The sum of $5x$ and $2x$ is at least 70.

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

7) The minimum value of $2x + 1$ is 13.

$$2x + 1 \geq 13$$

8) The maximum value of a number x is 3

$$x \leq 3$$

VII. Solve the following basic inequalities: (Use LISC)

1) A store makes \$7 on each watch sold. How many watches must be sold to make at least \$140?

Let
 $x =$ the
 # of
 watches
 sold

$$\frac{7x}{7} \geq \frac{140}{7}$$

$$x \geq 20$$

At least
 20 watches
 must be
 sold

$$7(20) = 140$$

$$140 \geq 140$$

2) Lori rents a car for \$88 a week plus \$0.28 a mile. How far can she drive if she wishes to spend a maximum of \$200?

let $x =$
of
miles
driven

$$\begin{array}{r} 88 + .28x \leq 200 \\ -88 \quad -88 \\ \hline .28x \leq 112 \\ \frac{.28x}{.28} \leq \frac{112}{.28} \\ x \leq 400 \end{array}$$

Lori can
drive a
maximum
of 400
miles.

$$\begin{array}{l} .28(400) = 112 \\ 112 + 88 = 200 \\ \hline 200 \leq 200 \end{array}$$

3) Brian is paid \$150 a week plus \$15 commission on each camera he sells. How many must he sell to make a minimum of \$600 a week?

let
 $x =$ the
of
cameras
sold

$$\begin{array}{r} 150 + 15x \geq 600 \\ -150 \quad -150 \\ \hline 15x \geq 450 \\ \frac{15x}{15} \geq \frac{450}{15} \\ x \geq 30 \end{array}$$

Brian must sell
a minimum
of 30
cameras.

$$\begin{array}{l} 15(30) = 450 \\ 450 + 150 = 600 \\ \hline 600 \geq 600 \end{array}$$

4) Sally is paid \$300 a week plus \$14 commission on each shirt she sells. How many must she sell to make at least \$400 for the week.

let
 $x =$ the
of
shirts
sold

$$\begin{array}{r} 300 + 14x \geq 400 \\ -300 \quad -300 \\ \hline 14x \geq 100 \\ \frac{14x}{14} \geq \frac{100}{14} \\ x \geq 7\frac{1}{7} \end{array}$$

Sally must
sell at
least
8
shirts

$$\begin{array}{l} 14(8) = 112 \\ 300 + 112 = 412 \\ 412 \geq 400 \\ \hline 14(7) = 98 \\ 300 + 98 = 398 \\ 398 \neq 400 \end{array}$$

Don't round
if they don't
tell you to
round