Unit 4:
Lesson 01

Word expressions and statements
Solving simple word problems

> When encountering an algebraic word expression:
>
> - First, define the variable.
> - Write the expression using the symbols of algebra.

In the following examples, define the variable, and then write the expression algebraically.

Example 1: "three less than a number"

n = the number

n – 3

Example 2: "10 more than the cost"

c = cost

c + 10

Example 3: "the difference between the population of the city and 22"

p = city population

p – 22

Example 4: "8 decreased by three times the score"

s = score

8 – 3s

Example 5: "ten times the sum of the weight of the man and three"

w = man's weight

10(w + 3)

Example 6: "the sum of ten times the weight of the man and three"

w = man's weight

10w + 3

Example 7: "four times the difference of the volume and two"

$$v = volume$$

$$4(v - 2)$$

Example 8: "five less than nine times the river's width"

$$w = river's\ width$$

$$9w - 5$$

All of the examples above were algebraic **expressions**.

An algebraic **statement** is when an algebraic expression is set equal to another expression or number. The result is an equation than can be solved. (Typically, some form of the word "**is**" is replaced with "**=**".)

In examples 9 and 10, define the variable, set up the equation, and then solve for the variable.

Example 9: If sixteen is subtracted from the weight, the result is twelve.

$$w = weight$$
$$w - 16 = 12$$
$$w - 16 + 16 = 12 + 16$$
$$w = \boxed{28}$$

Example 10: Four less than one-half of a number is six.

$$n = the\ number$$
$$\frac{1}{2}n - 4 = 6$$
$$\frac{1}{2}n - 4 + 4 = 6 + 4$$
$$\frac{1}{2}n = 10$$
$$2 \cdot \frac{1}{2}n = 10 \cdot 2$$
$$n = \boxed{20}$$

Assignment: In problems 1 – 8, define the variable(s), and then write the expression algebraically.

1. "six more than the number"	2. "twenty-nine less than his age"
3. "eighteen decreased by 4 times the weight of the package"	4. "two times the difference of the width of the box and 8"
5. "the difference between the depth of the pool and 11"	6. "nine less than five times the height of the water tower"
*7. "eleven times the sum of two different numbers"	8. "six times the difference of a number and 3"

In the following problems, define the variable, set up the equation, and then solve for the variable.

9. If eight is added to the diameter of the asteroid, the result is eleven.

10. Four times the sum of a number and -8 gives a value of sixteen.

11. When six is decreased by four times the number of calories, the result is negative eighteen.

*12. Two more than one-fifth the altitude is the same as the altitude.

13. Twice the number of pears increased by three times the number of pears is exactly 125.

14. If the teacher would just give me 8 more points, I would be passing with a 70.

\