

Linear Equations with One Variable



This sheet is designed as a review aid. If you have not previously studied this concept or after reviewing the contents you still don't pass you should enroll in the appropriate math class.

A linear equation is an equation whose solution is a straight line.

A linear equation with one variable can be solved through a simplification of the equation and then solving for the variable.

EXAMPLE:

A student has earned scores of 87, 81, and 88 on the first 3 of 4 tests. If the student wants an average (arithmetic mean) of exactly 87, what score must she earn on the fourth test?

Write the problem out (s represents the variable (score) to be found) then work it:

$$s = (87 \times 4) - (87 + 81 + 88)$$

$$s = 358 - 256$$

$$S = 92$$

87×4 determines the total need for a mean average of 87 with 4 tests.

$87 + 81 + 88$ determines the total to date.

The difference between the two totals is the score needed on the last test to obtain the average of 87.

Some problems may be more complicated and require additional steps to solve.

Example: $2(3 + a) + a(1 - 4a) + 5$

Clear the parentheses through multiplication:

$$(2 \times 3 = 6) + (2 \times a = 2a) + (a \times 1 = a) + [a \times (-4a) = -4a^2] + 5$$

$$6 + 2a + a - 4a^2 + 5$$

Combine like terms to simplify:

$$(6 + 5 = 11) + (2a + a = 3a) - 4a^2$$

$$11 + 3a - 4a^2$$

Since we don't know what this problem is equal to, it is solved as far as it can be. When a number is placed in the space of the variable "a" the problem can then be solved. The statement to solve it may be "**Solve for a = 2**" in which case you would insert a 2 in every location where there is an "a".

$$11 + 3(2) - 4(2^2) = 11 + 4 - 4(4) = 17 - 16 = 1$$

In solving for $a = 2$ the answer is 1.