Word Problems Made Easy

1) This is an introductory post to word problems.

2) It deals primarily with the translation of word problems into equations.

3) Discussions relating to specific types of word problems will be dealt with separately (see end of post).

The Following Points Outline a General Approach to Word Problems :

1) Read the entire question **carefully** and get a **feel** for what is happening. Identify what kind of word problem you're up against.

2) Make a note of **exactly** what is being asked.

3) **Simplify the problem** - this is what is usually meant by *'translating the English to Math'*. Draw a figure or table. Sometimes a simple illustration makes the problem much easier to approach.

4) It is not always necessary to start from the first line. Invariably, you will find it easier to **define what you have been asked for and then work backwards** to get the information that is needed to obtain the answer.

5) Use *variables* (a, b, x, y, etc.) or *numbers* (100 in case of percentages, any common multiple in case of fractions, etc.)

depending on the situation.

6) Use **SMART** values. Think for a moment and choose the best possible value that would help you reach the solution in the quickest possible time. DO NOT choose values that would serve only to confuse you. Also, remember to make note of what the value you selected stands for.

7) Once you have the equations written down it's time to **do the math!** This is usually quite simple. Be very careful so as not to make any silly mistakes in calculations.

8) Lastly, after solving, **cross check** to see that the answer you have obtained corresponds to **what was asked.** The makers of these GMAT questions love to trick students who don't pay careful attention to what is being asked. For example, if the question asks you to find 'what fraction of the remaining…' you can be pretty sure one of the answer choices will have a value corresponding to 'what fraction of the total…'

Translating Word Problems

These are a few common English to Math translations that will help you break down word problems. My recommendation is to refer to them only in the initial phases of study. With practice, decoding a word problem should come naturally. If, on test day, you still have to try and remember what the math translations to some English term is, you haven't practiced enough!

ADDITION : increased by ; more than ; combined ; together ;

total of ; sum ; added to ; and ; plus

SUBTRACTION : decreased by ; minus ; less ; difference between/of ; less than ; fewer than ; minus ; subtracted from

MULTIPLICATION : of ; times ; multiplied by ; product of ; increased/decreased by a factor of (this type can involve both addition or subtraction and multiplication!)

DIVISION : per ; out of ; ratio of ; quotient of ; percent (divide by 100) ; divided by ; each

EQUALS : is ; are ; was ; were ; will be ; gives ; yields ; sold for ; has ; costs ; adds up to ; the same as ; as much as

VARIABLE or VALUE : a number ; how much ; how many ; what

Some Tricky Forms :

'*per*' means '*divided by*'•

Jack drove at a speed of 40 miles per hour OR 40 miles/hour.

'*a*' sometimes means '*divided by*'

Jack bought twenty-four eggs for $3 a dozen.

'*less than*'

In English, the 'less than' construction is **reverse** of what it is in math.
For example, '3 less than x' means 'x - 3' NOT '3 - x'
Similarly, if the question says 'Jack's age is 3 less than that of Jill', it means that Jacks age is 'Jill's age - 3'.

The '*how much is left*' construction

Sometimes, the question will give you a total amount that is made up of a number of smaller amounts of unspecified sizes. In this case, just assign a variable to the unknown amounts and the remaining amount will be what is left after deducting this named amount from the total.
Consider the following:
A hundred-pound order of animal feed was filled by mixing products from Bins A, B and C, and that twice as much was added from Bin C as from Bin A.
Let "a" stand for the amount from Bin A. Then the amount from Bin C was "2a", and the amount taken from Bin B was the remaining portion of the hundred pounds: 100 - a - 2a.

In the following cases, order is important:

'*quotient/ratio of*' construction •

If a problems says 'the ratio of x and y', it means 'x divided by y' NOT 'y divided by x'

'difference between/of' construction

If the problem says 'the difference of x and y' it means 'x - y'

Now that we have seen how it is possible, in theory, to break down word problems, lets go through a few simple examples to see how we can apply this knowledge.

Example 1.

The length of a rectangular garden is 2 meters more than its width. Express its length in terms of its width.

Solution 1.

Key words: more than (implies addition); is (implies equal to)

Thus, the phrase 'length is 2 more than width' becomes:

Length = 2 + width

Example 2.

The length of a rectangular garden is 2 meters less than its width. Express its length in terms of its width.

Solution 2.

Key words: less than (implies subtraction but in reverse order); is (implies equal to)

Thus, the phrase 'length is 2 less than width' becomes:

Length = width - 2

Example 3.

The length of a rectangular garden is 2 times its width. Express its length in terms of its width.

Solution 3.

Key words: times (implies multiplication); is (implies equal to)
Thus, the phrase 'length is 2 times width' becomes:
Length = 2*width

Example 4.

The ratio of the length of a rectangular garden to its width is 2. Express its length in terms of its width.

Solution 4.

Key words: ratio of (implies division); is (implies equal to)
Thus, the phrase 'ratio of length to width is 2' becomes:
Length/width = 2 → Length = 2*width

Example 5.

The length of a rectangular garden surrounded by a walkway is twice its width. If difference between the length and width of just the rectangular garden is 10 meters, what will be the width of the walkway if just the garden has width 6 meters?

Solution 5.

Ok this one has more words than the previous examples, but don't worry, lets break it down and see how simple it becomes.
Key words: and (implies addition); twice (implies multiplication); difference between (implies subtraction where order is important); what (implies variable); is, will be (imply equal to)

Since this is a slightly more complicated problem, let us first define what we want.

'What will be the width of the walkway' implies that **we should assign a variable for width of the walkway** and find its value.

Thus, let width of the walkway be 'x'.

Now, in order to find the width of walkway, we need to have some relation between the **total length/width of the rectangular garden + walkway and the length/width of just the garden**.

Notice here that if we assign a variables to the width and length of either garden+walkway or just garden, we can express every thing in terms of just these variables.

So, let length of the garden+walkway = L

And width of garden+walkway = W

Thus length of just garden = L - 2x

Width of just garden = W - 2x

Note: Remember that the walkway completely surrounds the garden. Thus its width will have to be accounted for twice in both the total length and total width.

Now let's see what the question gives us.

'Garden with width 6 meters' translates to:
Width of garden = 6
W - 2x = 6
Thus, if we know W we can find x.

'Length of a rectangular garden surrounded by walkway is twice its width' translates to:
Length of garden + length of walkway = 2*(width of garden + width of walkway)
L = 2*W

'Difference between the length and width of just the rectangular garden is 10 meters' translates to:
Length of garden - width of garden = 10
(L - 2x) - (W - 2x) = 10
L - W = 10

Now, since we have two equations and two variables (L and

W), we can find their values. Solving them we get: L = 20 and W = 10.

Thus, since we know the value of W, we can calculate ‘x’

10 - 2x = 6
2x = 4
x = 2

Thus, the width of the walkway is 2 meters.

Easy wasn’t it?

With practice, writing out word problems in the form of equations will become second nature. How much you need to practice depends on your own individual ability. It could be 10 questions or it could be 100. But once you’re able to effortlessly translate word problems into equations, more than half your battle will already be won.

Let us now move onto specific word problem topics :

1) 'Work' Word Problems : work-word-problems-made-easy-87357.html
2) 'Distance/Speed/Time' Word Problems : distance-speed-time-word-problems-made-easy-87481.html

(Remaining will be added soon!)

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Click below to check out some great tips and tricks to help you deal with problems on Remainders!
compilation-of-tips-and-tricks-to-deal-with-remainders-86714.html#p651942

Word Problems Made Easy!
1) Translating the English to Math : word-problems-made-easy-87346.html
2) 'Work' Problems Made Easy : work-word-problems-made-easy-87357.html
3) 'Distance/Speed/Time' Word Problems Made Easy : distance-speed-time-word-problems-made-easy-87481.html