

PROCEDURE FOR SOLVING WORD PROBLEMS

Listed below are several steps used in solving word problems followed by an example of how this procedure can be used.

- 1) Read the problem slowly and carefully.
- 2) Re-read the problem if necessary to discover the facts.
- 3) Decide what the problem is asking.
- 4) Think how facts relate to what the problem asks.
- 5) Re-state the problems in your own words.
- 6) List the given information (what is given).
- 7) List what you are to find (what to find).
- 8) Select a symbol to represent the unknown number, and, in terms of this symbol, express the given information.
- 9) Use mathematical symbols to translate the information into a math sentence.
- 10) Write down the equation expressing a relationship between the given numbers and the symbolic numbers.
- 11) Solve the equation for the unknown value.
- 12) Check the solution by replacing the unknown value with the known value.

Although there is no single procedure to cover all variations of word problems, certain steps can give proper direction to the analysis of specific problems.

Example: A father is 26 years older than his son. In nine years, he will be twice as old as his son. Find their ages now.

Step 1) Make sure that you understand what you are reading, even if it means reading the problem several times, jotting down numbers, drawing sketches, estimating, etc. Make sure that you understand what is being asked for, and what facts are told to you. Restate essential facts of the problem in your own words. (Points 1 - 5 of Procedure).

Information Given:

Facts to Find

- | | |
|--|----------------------------|
| a) the father is 26 years older than his son at the present time. | a) find their present ages |
| b) In nine years, or when each is nine years older, the father will be twice as old as the son.
(Points 6 - 7 on Procedure List) | |

Step 2) Choose carefully the representation of the variable to be involved. Be concise and accurate in your statements. (Point 8 on Procedure List)

In this problem there are two unknowns: the father's age and the son's age

You may begin by saying: Let, $x =$ son's age at present
Then, $x + 26 =$ father's age at present

Step 3) Use the other facts involved to determine the equation. The other facts deal with their ages in nine years. (Points 9 & 10 on Procedure List)

So,

$$\begin{aligned}x + 9 &= \text{son's age in nine years} \\(x + 26) + 9 &= \text{father's age in nine years}\end{aligned}$$

We know that in 9 years, the father will be twice as old as the son:

$$(x + 26) + 9 = 2(x + 9)$$

Step 4) Solve the equation: $(x + 26) + 9 = 2(x + 9)$

$$x + 35 = 2x + 18$$

$$17 = x$$

Now, since x represents the son's age now, their ages are 17, 43.
(Point 11 on Procedure List)

Step 5) Check your solution.

If $x = 17$ is son's age now, then $x + 26 = 43$ is father's age now.

In nine years, $17 + 9 = 26$ is the son's age, and $43 + 9 = 52$ is the father's age.

In nine years the father's age is twice the son's age so, $52 = 2(26)$.
(Point 12 on Procedure List)