



GENERAL APPROACH TO WORD (STORY) PROBLEMS

1. **Read the problem and be sure you understand all words** -- product, perimeter, head wind, equilateral, etc. If there are any unfamiliar words, look them up in the text or in a dictionary.
2. **Restate the problem in your own words**, making a sketch if appropriate. Without looking at the problem, explain what is known and what is being asked.
3. **Decide what is being asked for and assign it (them) a letter.** Do not worry about the number of variables. One person may understand a problem best using only one variable while another person prefers two. Do what makes sense to you.
4. **Write a clear description of the unknown**, being sure to include units.

A statement such as "x = distance" does not say enough. A complete description might be "x = the distance (in miles) the speeder travels before being overtaken by the police".

The following are examples of well defined variables.

- x = length of the radius (in inches)
- x = the number of nickels in Jack's pocket
- x = Jane's age three years ago (in years)
- x = boat's speed in still water (in miles/hour)

Some people prefer to use a table (grid) to arrange their information. If you like this method, then be sure you clearly understand the meaning of each entry. Test yourself by selecting an entry and explaining it.

5. **Translate each English statement into a mathematical statement.** (Note that special symbols exist for such words as "product", "difference", "is", etc.)
6. **Test each equation to be sure it is correct.** For example, if the problem says that there are twice as many dimes as quarters, pretend there are 12 dimes and 6 quarters and see if these numbers work in your equation.
7. **Solve the equation(s) for the unknown(s).** Recall all the methods you have learned: substitution, elimination, factoring, the quadratic formula, etc.
8. **Substitute your results into the original problem** to be sure that all conditions are satisfied.
9. **Answer the question**, giving units as needed.

SEE "MATHLISH"
HANDOUT.

Word Problems

These problems get progressively harder. Do not be worried if some of the problems go beyond your current skills.

- 1) One number is four more than another. Their sum is twenty. Find both numbers.
- 2) One number is three less than another. Their sum is seventeen. Find the numbers.
- 3) A 20 foot rope is cut in two pieces so that one cut piece is three times as long as the other. How long is each piece?
- 4) The length of a rectangle is five more than the width. The perimeter is 42. Find the length and width.
- 5) The length of a rectangle is three less than four times the width. The sum of the length and width is twelve more than the twice the width. Find the width.
- 6) One side of a triangle is twice the first side. The third side is five longer than the first side. If the perimeter is 17, find the length of each of the three sides.
- 7) Jeannie has a book her father gave her that is 8 times as old as she is. However, the book's age in 3 years will be the same as 6 times Jeannie's age in 3 years plus 9. How old is Jeannie now?
- 8) The sum of a daughter's age and father's age is 41 and the difference is 31. How old is each?
- 9) In a pile of coins containing only dimes and nickels, there are seven more dimes than nickels. If the total value of all of the coins in the pile is \$1.00, how many of each type of coin is in the pile?
- 10) Jack is 5 years younger than Jill. Five years ago Jack was two-thirds as old as Jill was then. How old will they be in two years?
- 11) The speed of a stream is 4 mph. A boat travels 7 miles upstream in the same time it takes to travel 12 miles downstream. What would be the speed of the boat in still water?
- 12) Mary is 8 years older than her lamb. In two years, twice Mary's age will be one less than three times the lamb's age three years ago. How old is each now?

Answers:

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| 1) 8 and 12 | 7) 12 |
| 2) 7 and 10 | 8) father is 36; daughter is 5 |
| 3) 15 and 5 | 9) 9 dimes and 2 nickels |
| 4) length = 13; width = 8 | 10) Jill will be 22; Jack will be 17 |
| 5) 5 | 11) 15.2 mph |
| 6) 3, 6, and 8 | 12) Mary is 38 and the lamb (now a very old sheep) is 30. |