A system for problem solving (the UPIC method)

Understand the problem

1. Read the math problem once quickly to obtain an idea of its general nature.
2. Next read the problem carefully. **Underline the relevant information or key words**. Understand what facts and/or relationships do they have?
3. Ignore the irrelevant info. Organize or rephrase the important information.
4. **Circle the question(s). It's very important to accurately understand what are being asked. Restate the question(s) if necessary.** What do you know that is not stated in the problem?

Pick a strategy or method to solve the problem

1. Think whether solved similar problems in the past.
2. Decide what strategy or a combination of strategies to use. Most commonly used strategies are "draw pictures", "list/table", "work backward", or guess and check.
3. Try a strategy that seems as if it will work.
4. If it doesn't, it may lead to another one that may.

Implement and Solve it

1. Using the strategy selected, work the steps to solve the problem.
2. It may involve in deciding what operations must be performed and in what order, and then carry out the computation.
3. Box the answer.

Check and verify the answer(s)

1. Reread the question(s).
2. Ask whether answered all question(s).
3. If answering with unit, make sure it's correct unit. (In most math contests, unit is not required. However, answer with wrong unit is considered to be wrong answer.)
4. Does your answer seem reasonable?
5. Verify the answer by using either approximation or puck the answer back in the question to check whether it makes sense.

While learning, write down the steps and show work
It is very important that the student be very methodical to record the steps taken to solve the problem. Why? It helps keep the mind organized when working the problem. It helps avoid making careless mistakes. It allows the teacher to correct the thinking or concepts. It helps check to make sure the answer is correct. In the future, one can refer back to solve similar problems.

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Possible problem solving strategies are:

- Draw a picture or diagram
- Make an organized list, chart, or table
- Work backward
- Use logical reasoning
- Guess and check or Trial and Error
- Find a pattern
- Deduction and elimination
- Write equation(s)
- Solve a simpler problem
- Compute or Simplify (arithmetic)
- Use formula
- Act it out