Writing A Warm-Up

This year, every member of the math team hoping to make the 'A' or 'B' team will be expected to write at least one MATHCOUNTS-style worksheet (Warm-Up, Workout, or Competition Round: Target, Sprint, or Team).

Guidelines for writing a good problem set:

1. **Variety:** Try to include different types of problems … some geometry, some algebra, some counting, some probability, some short and some long, some quick and tricky and some longer problems that require a list or difficult series of computations.

   Here is an **example** of a possible problem rundown with good variety:

   1. Geometry problem involving area.
   2. Algebra/Statistics problem involving mean.
   3. Ratio problem. (The ratio of boys to girls is 5:6 …)
   4. Cube-chopping problem (a painted cube is cut into 64 identical smaller cubes …)
   5. Function problem (the function $a \blacklozenge b$ is defined as …)
   6. Factoring trick problem.
   7. d=rt problem (Marsha runs to the store …)
   8. Probability problem involving dice.
   9. Casework counting problem (How many triangles are in the diagram …)
   10. Special right triangle problem.

2. **Creativity:** Sure, a few of your problems can be completely unoriginal (ex. What is the sum of the factors of 600?), but try to write 6-8 problems that combine skills in different ways, or ask common questions and use common tricks in unexpected ways.

   Instead of: What is the length in centimeters of the hypotenuse of a right triangle whose legs are 8cm and 15cm?
   Try: The difference between the squares of two consecutive odd integers is 2^6. The sum of the same two integers can be expressed 2^n. Find n.

   Instead of: Find the sum of 1 + 2 + 3 + … + 99 + 100.
   Try: Ruby plants a tree in her backyard. When she plants the tree, it has only one branch. At the end of the first day, the tree grows one new branch, and the old branch grows one new leaf. The next day the tree grows one new branch and each existing branch sprouts one new leaf. If the process continues, with a new leaf on each branch and a new branch each day, how many leaves will there be on the tree at the end of the 100^{th} day, when the tree has 101 branches?

   

3. **Style:** Do an advanced Google Image search and find clip art that suits a few problems. It took about 2 minutes to find the tree above. Use 10pt COMIC SANS MS (just use the template on my site please). Depending on your version of Word, you can type equations and modify images pretty easily. I can help on this. Save as .doc file.

4. **Difficulty:** Imagine taking your own test. You should expect to be able to get 6/10 correct in 10 minutes, and 9/10 correct in 15 minutes. Include a key.