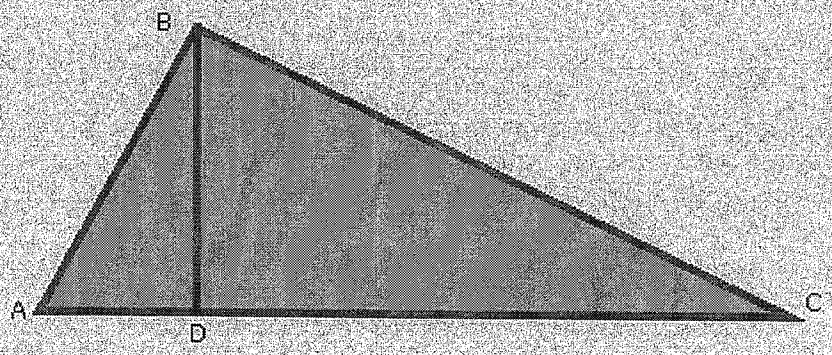
Washington State Math Championship 2008
Potpourri Test – Grade 6

Give an exact answer or one rounded to the nearest thousandth unless otherwise directed.

1. Throughout the years, many different groups of people have tried to find out how many licks it takes to get to the center of a Tootsie Roll Pop. One group from Whittier Elementary in Wisconsin found that it takes an average of 9 minutes to get to the center. Several other groups found that it took 252, 364, or 411 licks to get to the center. Using the average of the data those groups found, what is the average time spent on each lick, assuming that the licking is non-stop? Express your answer to the nearest tenth of a second.

2. How many two-digit numbers contain at least one even digit?

3. In the diagram below, $AD = 3$, $BD = 6$, and $DC = 9$, and AB is perpendicular to AC. What is the perimeter of the triangle ABC? Express your answer to the nearest whole number.



4. A 3x3x3 cube, made of all 1x1x1 blocks, has all six of its faces covered in bright neon pink paint. What fraction of the 1x1x1 blocks will have an *odd* number of faces covered with the bright neon pink paint?

5. At a local farm, horses cost \$10, pigs cost \$3, and cute little bunny rabbits are only \$0.50. A farmer wants to buy 100 animals for \$100. How many cute rabbits must the farmer buy? (There are two possible solutions; you need to find one of them)

6. How many possible seven-digit phone numbers are there if each of the seven digits is positive, each of the first six digits is a prime number, and the last digit is composite (in that order)?

7. Two three digit numbers are chosen such that the six digits used to represent the numbers are all different (i.e. 107 and 528). What is the largest possible product of these two three-digit numbers?

8. Ancient Egyptians described all of their fractions as the sum of unit fractions (a fraction with numerator equal to 1). What are the three unit fractions that sum to 6/7 if no fractions are less than 1/50? (hint: go about this systematically!)

9. Each time that either the second, minute or hour hand *is pointing to* the '12' on the clock between 7:30am and 9:01am (inclusive), a penny is added to a jar. How much money will be in the jar at 9:01am?

10. 100 students at some strange math competition in Blaine stood in a single-file line. Ahead of them were 100 lockers. The first student walks and opened every locker. The second student then walks and changes the position of every second locker (i.e. if a locker was closed, he/she opened it, and vice versa). The third student changes the position of every third locker, and so on. So, in other words, the k^{th} student changes the position of every k^{th} locker until the 100^{th} student goes and changes the position of the 100^{th} locker. How many lockers will be open at the end of this process?