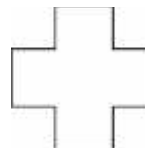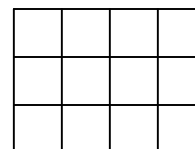# 2008 Rocket City Junior Math Mania
Geometry Test – 4th Grade

1. Which of the following is not a unit for length: mile, centimeter, inch, gram, yard?

2. What is the largest number of enclosed regions that can be formed by overlapping an equilateral triangle and a square?

3. What is the sum of the number of edges on a cube, the number of sides in a pentagon, and the number of faces on a rectangular prism?

4. How many lines of symmetry does the adjacent figure have?

5. How many minutes are in one week?

6. What is the supplement of a 38 degree angle?

7. What is the positive difference between the perimeter of a square with side length 7 and the area of a triangle with a base of 6 and a height of 3?

8. Find the volume of a rectangular prism with a square base of side 9 and a height of 5.

9. Jim is in downtown Huntsville, Alabama, where the streets are in the form of a unit grid and run parallel to the x and y axes. He is currently located at a restaurant at the point (1, 2).He must walk to the bank, which is located at (7, 5), then the library at the point (9, 12), and then finally back to the restaurant at (1,2). If he can only walk alongside the streets, and cannot cut across diagonally, how far will he walk, in units?

10. How many squares of any size can be found in the unit grid shown?

2008 Rocket City Junior Math Mania
Potpourri Test – 4th Grade

1. Tom, Anne, and Carol each own one bird. The birds are red, yellow, and blue, and are named Polly, Quack, and Siren. If Tom's bird is larger than Quack and smaller than the blue bird, and Anne's bird is smaller than both the yellow bird and Polly (two different birds), what are the name and color of Carol's bird?

2. How many three-digit positive integers are divisible by six?

3. In the cryptarithm shown, each instance of a letter represents the same digit 0-9 and no two different letters represent the same digit (i.e. if one A is 3, all A's are 3's and B is not 3). What is the largest possible value of the positive four-digit integer ABCD?

    AB
    $\underline{\times C}$
    BD
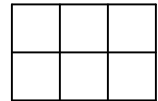
4. How many rectangles of any size and shape are there in the array of unit squares shown?

5. What is the sum of the first 6 terms of an infinite geometric sequence beginning 2, 6, 18, …?

6. How many subsets of the set $\{2,3,5,7\}$ contain the element 3?

7. What is the next term of the sequence 2, 5, 9, 14, 20, 27, __?

8. How many positive integers are factors of 48?

9. What is the sum of A, B, and C?

    A is the difference between 148 and 92.
    B is the product of 9 and 18.
   C is the quotient of 345 and 3.

10. What is the smallest prime number greater than 100?

2008 Rocket City Junior Math Mania
Probability Test – 4th Grade

1. How many ways can a party select a presidential and a vice-presidential candidate from a field of seven candidates?

2. When two fair, six-sided dice are rolled, what is the probability that the sum of the numbers shown is four?

3. When three fair coins are flipped, what is the probability that exactly one of them shows heads?

4. In a school with 87 students, there are 56 girls and 14 students with straight A's. If 25 boys do not have straight A's, how many girls do not have straight A's?

5. In an Olympic qualifying race, the first three people across the finish line will qualify to compete in the Olympics. How many different sets of qualifiers can be selected in a race with eight competitors?

6. How many ways are there to arrange the letters in the word "COFFEE"?

7. In the grid of unit squares shown, how many paths of length seven are there from the upper left corner to the lower right corner traveling along grid lines?
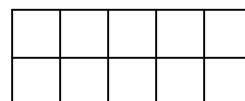
8. The probability of rain tomorrow is $\frac{3}{4}$, while the probability of wind tomorrow is $\frac{1}{3}$. If these are independent events, what is the probability that it is neither rainy nor windy tomorrow?

9. How many ways can five people sit around a round table?

10. Sam and Max play a game in which the first person to get heads when they flip a fair two-sided coin wins. The first player gets to flip the coin once, then the second player gets to flip the coin twice, then the first player gets to flip the coin three times, then the second player gets to flip the coin four times. What is the probability that no one has won the game after the process described?