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# MATHCOUNTS

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1995-~~1996~~

■ State Competition ■

Target Round

Problems 1 and 2

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Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

## DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO

This round of the competition consists of eight problems. They will be presented to you in pairs. Work on one pair of the problems will be completed and answers will be collected before the next pair is distributed. The time limit for each set of two problems is six minutes. The first pair of problems is on the other side of this sheet. When told to do so, turn the page over and read silently as the problems are read aloud. Pencils are to be down while the problems are being read. When instructed to begin, pick up your pencil and begin working. Record your final answer in the designated space on the problem sheet. All answers must be complete, legible, and simplified to lowest terms. This round assumes the use of calculators, and calculations may also be done on scratch paper, but no other aids are allowed. If you complete the problems before time is called, use the time remaining to check your answers.

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Total Correct	Scorer's Initials

MATHCOUNTS is a cooperative project of the National Society of Professional Engineers, the CNA Insurance Companies, The Dow Chemical Company Foundation, the General Motors Foundation, the Intel Foundation, Texas Instruments Incorporated, the National Council of Teachers of Mathematics, and the National Aeronautics and Space Administration.

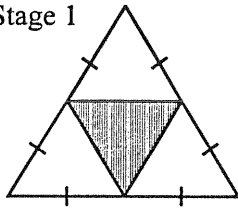
1. The number 632 is considered a "multiple number" since the first digit is the product of the rest of the digits of the number. How many 3-digit multiple numbers exist?

1. \_\_\_\_\_

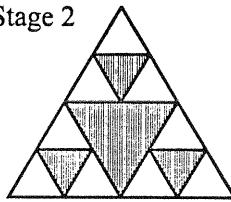
2. At each stage the midpoints of the sides of each unshaded equilateral triangle are connected and the triangle formed is shaded. Continuing in this process, what is the number of the stage when the shaded area is first larger than 90% of the area of the original equilateral triangle?

2. \_\_\_\_\_

Stage 1



Stage 2



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# MATHCOUNTS

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1995-~~1996~~

■ State Competition ■

Target Round

Problems 3 and 4

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Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

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3. How many units are in the sum of the lengths of the three altitudes in a triangle with sides 7, 24, and 25? Express your answer as a decimal to the nearest hundredth.

3. \_\_\_\_\_

4. To make one pound of honey, a worker bee must visit 25 million flowers. An average visit at a flower, including flight time to the flower, is 30 seconds. How many days will it take, to the nearest day, for a swarm of 10,000 worker bees to continually visit enough flowers to make 5 pounds of honey?

4. \_\_\_\_\_

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# MATHCOUNTS

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1995-~~96~~

■ State Competition ■

Target Round

Problems 5 and 6

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Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

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1994 - 95 State Target Round

5. The rectangle with vertices  $R(9, 3)$ ,  $E(9, -1)$ ,  $C(3, -1)$ , and  $T(3, 3)$  is rotated  $180^\circ$  in the plane about the point  $(2, -4)$ . What are the new coordinates of vertex  $R$  expressed as an ordered pair?

5. \_\_\_\_\_

6. How many even four-digit numbers can be formed if the sum of the middle two digits must equal 10?

6. \_\_\_\_\_

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# MATHCOUNTS

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1995 ~~1994~~

■ State Competition ■

Target Round

Problems 7 and 8

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Name \_\_\_\_\_

School \_\_\_\_\_

Chapter \_\_\_\_\_

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# 1994-95 State Target Round

7. Two fair dice, each with faces numbered 1 through 6, are rolled at the same time. Each die has five exposed faces, which are summed. Express as a common fraction the probability that the least common multiple of the sums of the exposed faces is a multiple of 6.

7. \_\_\_\_\_

8. The Great Pyramid is a right pyramid whose square base measures 756 feet along each edge. An ant is crawling on the pyramid along the shortest path from the ground to the vertex. When she reaches the vertex she is 481 feet above the base. To the nearest tenth of a foot, what is the positive difference between the distance she crawled and the height of the pyramid?

8. \_\_\_\_\_