MATHCOUNTS

1990-91

■ State Competition ■

Target Round

Questions 1 and 2

Name _____

School _____

Chapter _____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This section of the contest consists of eight problems. They will be presented to you in pairs. Work on one pair of the questions 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 question sheet. All answers must be complete, legible and simplified to lowest terms. Calculators are permitted during this round, and calculations may also be done on scratch paper, but no other aids are allowed. If you complete the questions before time is called, use the time remaining to check your answers.

Total Correct	Scorer's Initials

MATHCOUNTS is a cooperative project of the National Society of Professional Engineers, the CNA Insurance Companies, the Cray Research Foundation, the General Motors Foundation, the National Council of Teachers of Mathematics, and the National Aeronautics and Space Administration.

1. A plane left an airport and flew 3 miles north, 5 miles west, 2 miles north, 3 miles west, and then flew directly back to the airport. To the nearest tenth of a mile, find the total distance travelled.

1. _____

2. Two different prime numbers are selected at random from among the first ten prime numbers. What is the probability that the sum of the two primes is 24? Express your answer as a common fraction.

2. _____

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Target Round

Questions 3 and 4

Name _____

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Chapter _____

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3. If Rosa's age is divided by 2, 3, 4, or 6, the remainder is 1. If her age is divided by 7, the remainder is 0. She is less than 75 years old. How many years old is Rosa?

3. _____

4. In how many different ways can a panel of four on-off switches be set if no two adjacent switches may be off?

4. _____

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■ State Competition ■

Target Round

Questions 5 and 6

Name _____

School _____

Chapter _____

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5. How many terms are contained in the sequence 5, 9, 13, 17, . . . , 601? 5. _____

6. A circular sheet of paper of radius 6 inches is cut into 3 equal sectors, and each sector is formed into a cone with no overlap. What is the height in inches of each cone? 6. _____

MATHCOUNTS

1990-91

■ State Competition ■

Target Round

Questions 7 and 8

Name _____

School _____

Chapter _____

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7. The Octal Society has asked you to distribute \$1,234 in prize money. The dollar amounts of the prizes are \$1, \$8, \$64, and \$512. What is the fewest number of prizes you can award if you use the total amount? 7._____

8. A railroad trestle spans a gorge 80 feet wide and connects two cliffs at heights of 112 and 172 feet above the bottom of the gorge. A train is crossing this gorge from the higher cliff to the lower. When the front of the train has travelled $\frac{3}{4}$ of the trestle's length, how many feet is it above the bottom of the gorge? 8._____