MATHCOUNTS

1991-92

■ 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. This round assumes the use of a calculator, 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

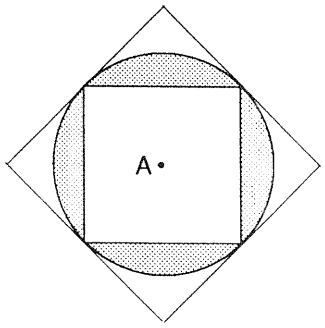
MATHCOUNTS is a cooperative project of the National Society of Professional Engineers, the CNA Insurance Companies, the Cray Research Foundation, the General Motors Foundation, the National Council of Teachers of Mathematics, and the National Aeronautics and Space Administration.

1. Any even whole number greater than 7 can be written as the sum of two distinct primes. What is the largest product for two such primes whose sum is 150?

1. _____

2. In the figure, point A is the center of the circle and the squares. The length of a side of the outer square is 4 cm. Find the area of the shaded region to the nearest square centimeter. Use 3.14 for π.

2. _____



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Target Round

Questions 3 and 4

Name _____

School _____

Chapter _____

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3. A seven-digit telephone number has two identical missing digits so that it reads 276-9?4?. If the seven-digit number is divisible by 7, how many phone numbers are possible?

3. _____

4. A man born in the early part of the 19th century was x years old in the year x^2, while a woman born in the latter part of the 19th century was y years old in the year y^2. How many years apart were they born?

4. _____

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Target Round

Questions 5 and 6

Name _____

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Chapter _____

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5. What is the smallest value of n for which the following statement is true? 5. _____

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \ldots + \frac{1}{n} > 2$$

6. An isosceles triangle with equal sides of 5 inches and a base of 6 inches is inscribed in a circle. What is the radius, in inches, of the circle? Express your answer as a mixed number. 6. _____

MATHCOUNTS

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■ State Competition ■

Target Round

Questions 7 and 8

Name _____

School _____

Chapter _____

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7. An antique vase increases in value 50% each year. If the vase was purchased January 2, 1992, in what year will its January value first exceed ten times its purchase price?

7. _____

8. If you must always be moving from the left toward the right, how many paths can you take from point S to point T?

8. _____