
MATHCOUNTS

1992-93

■ 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 competition 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, Texas Instruments Incorporated, the National Council of Teachers of Mathematics, and the National Aeronautics and Space Administration.

1. What number is less than 35^2 , greater than 34^2 , divisible by 19, and a multiple of 9?

1. _____

2. Alfreda hiked half her planned trip the first day; tiring, she only covered one-third the remaining distance the second day; rain slowed her to one-fourth the remaining distance the third day, and the fourth day she hiked three miles, which was one-fifth of what she had left. How many miles did she hike during the the four days.

2. _____

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Questions 3 and 4

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3. A square pyramid has a base edge of 32 inches and an altitude of 1 foot. A square pyramid whose altitude is one-fourth of the original altitude is cut away at the vertex. The volume of the remaining frustrum is what fractional part of the volume of the original pyramid?

3. _____

4. The yearly changes in the population census of a town for four consecutive years are:

4. _____

year 1	30% increase
year 2	30% increase
year 3	30% decrease
year 4	30% decrease

To the nearest 1%, what is the absolute value of the change in population over the four years?

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Target Round
Questions 5 and 6

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Chapter _____

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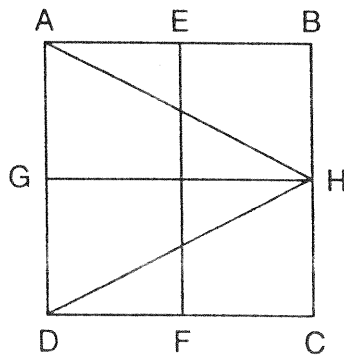
5. The table below represents the relationship between x and y in a quadratic equation of the form $y = ax^2 + bx + c$, where a , b , and c are integers. What is the value of a ?

5. _____

x	1	2	3	4	5	6	7
y	-8	5	24	49	80	117	160

6. In square $ABCD$, points E , F , G , and H are midpoints of the sides. If squares count 2 points, right triangles count 5 points and other triangles count 7 points, what is the total value of the figure shown?

6. _____



MATHCOUNTS

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■ State Competition ■

Target Round

Questions 7 and 8

Name _____

School _____

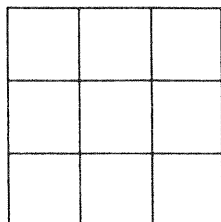
Chapter _____

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7. Three darts are thrown at the figure given, each landing in a different square. What is the probability that the squares they land in form a row, either horizontally, vertically, or diagonally? Express your answer as a common fraction.



7. _____

8. What is the y-intercept of the line that is the perpendicular bisector of the segment joining $(-3, -4)$ and $(5, 10)$? Express your answer as a mixed number.

8. _____