MATHCOUNTS®

2015
■ Chapter Competition ■
Target Round
Problems 1 & 2

Name _____

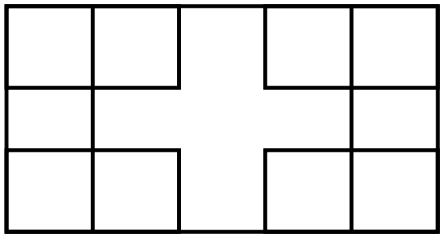
School _____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This section of the competition consists of eight problems, which will be presented in pairs. Work on one pair of problems will be completed and answers will be collected before the next pair is distributed. The time limit for each pair of 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 begin working. This round assumes the use of calculators, and calculations also may be done on scratch paper, but no other aids are allowed. All answers must be complete, legible and simplified to lowest terms. Record only final answers in the blanks in the left-hand column of the problem sheets. If you complete the problems before time is called, use the time remaining to check your answers.

Total Correct	Scorer's Initials

1. _____rectangles_____ How many rectangles of any size are in the figure shown?



2. _____calories_____ A fudge recipe yields a batch of fudge that contains 40,000 calories and fills a 9-inch by 13-inch pan to a depth of 1 inch. How many calories are in each cubic inch of fudge made using this recipe? Express your answer to the nearest whole number.

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Problems 3 & 4

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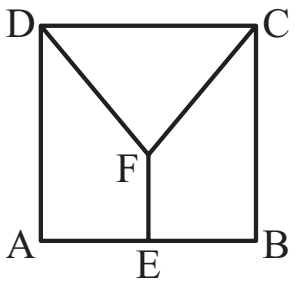
3. _____ For some integer k, the first three terms of an arithmetic sequence are k, $2k + 3$, and $4k + 1$, in that order. What is the integer value of the fourth term of the sequence?

4. _____ cm Square ABCD measures 6 cm on each side. If the three interior segments divide the square into two congruent trapezoids and an isosceles triangle, all of equal area, what is the length of segment EF?



MATHCOUNTS®

2015
■ Chapter Competition ■
Target Round
Problems 5 & 6

Name _____

School _____

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Total Correct	Scorer's Initials

5. _____ What is the least positive integer that has only 1s and 0s as digits and is a multiple of 75?

6. _____ All points that are equidistant from (2, 2) and (9, 3) lie on a line with equation $ax + by = c$, where the positive integers a, b and c have no common factors greater than 1. What is the value of $a + b + c$?

MATHCOUNTS®

2015
■ Chapter Competition ■
Target Round
Problems 7 & 8

Name _____

School _____

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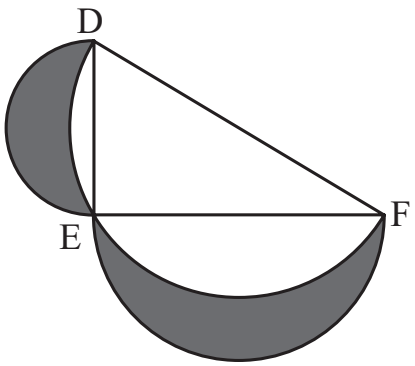
Total Correct	Scorer's Initials

7. _____ m^2 Right triangle DEF, with sides of integer length, has a perimeter of 40 m. Semicircles are drawn with diameter DE and diameter EF, as shown. If arc DEF is a semicircle, what is the total area of the shaded regions?



8. _____ If f is a function such that $f(x) + \frac{1}{x} \cdot f\left(-\frac{1}{x}\right) = 3$, what is the value of $f(2)$? Express your answer as a common fraction.