

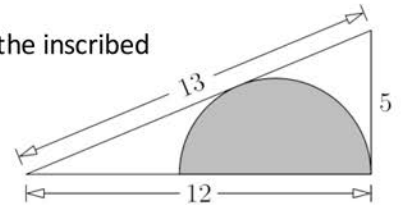
CCMS Math Challenge - Easy Problem Set 2 - November 1, 2015

Middle and high school students are invited to solve these math problems. Answers will be published on the website at the end of each month. A **more difficult** set is also available, that will be graded.

Details at: ccms.claremont.edu/mc

1. The sum of the digits of a seven-digit number is 6. What is the product of these digits?
2. Alice and Bob use an encoding system for the messages they exchange. First, each letter of the alphabet is assigned a number, as follows: A=1, B=2, ...Z=26. In the message, each letter is converted to a number calculated by the formula $2n+9$, where n is the number originally assigned to the letter. One morning, Bob receives a sequence of numbers 25-19-45-38. What is Alice's original message?

3. The diagram shows a right triangle with sides 5, 12, and 13. What is the radius of the inscribed semicircle?



4. Using the whole numbers from 1 to 22 inclusive, Horatio wants to form eleven fractions by choosing one number as the numerator, and one number as the denominator. Every number will be used exactly once. What is the maximum number of Horatio's fractions that could have an integer value?
5. Julio creates a procedure for turning a set of three numbers into a new set of three numbers: each number is replaced by the sum of the other two. For example, {3,4,6} becomes {10,9,7}, which becomes {16,17,19}, and so on. How many times must Julio apply this procedure starting with the set {1,2,3} before he first obtains a set containing the number 2013?
6. A class of students had a test. If each boy had obtained 3 points more on the test, then the average result of the class would have been 1.2 points higher. What percentage of the class are girls?