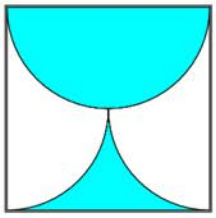
Claremont Center for the Mathematical Sciences

CCMS Math Challenge - Easy Problem Set 4 - February 1, 2016

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 shaded part of the square with side a is bounded by a semicircle and two quarter arcs. What is its area?



2. Mr Candle bought 100 candles. He burns one candle every day and always makes one new one from the remaining wax of seven burnt candles. After how many days will he have to go and buy new candles again?

3. Robert has three candy dispensers, each releasing one candy at a time. He cannot see inside the dispensers but he knows that one contains cherry-flavoured candies, another one contains lemon-flavoured candies, and the third contains candies of both flavours. He also knows that the labels of the dispensers have been swapped and they are all wrong. What is the minimum number of candies that Robert has to dispense, in order to find out how to re-label all the three dispensers correctly?

4. Ann has walked 8 km at a speed of 4 km/h. Now she will run some time with a speed of 8 km/h. How long does she have to run in order to have an overall average speed of 5 km/h?

5. In the equation,

$$N \times U \times (M + B + E + R) = 33,$$

each letter stands for a different digit (0, 1, 2, ..., 9).
How many different ways are there to choose the values of the letters?

6. Consider the set of all the 7-digit numbers that can be obtained using, for each number, all the digits 1, 2, 3,..., 7. List the numbers of the set in increasing order and split the list exactly at the middle into two parts of the same size. What is the last number of the first half?