Department of Mathematics
# PROBLEM SOLVING CHALLENGE

February 2014

1. Seamus is using all 120 inches of a piece of copper wire to build a rectangle that is five times as long as it is wide, and a square whose side length is the same as the width of the rectangle. What will be the exact area of the square?

2. The following figure shows the dimensions of a lift. What is the longest possible length of a stick that can be put inside the lift? (Give your answer to the nearest cm). You must show or explain how you found your solution to the answer.


120cm

240 cm

90 cm
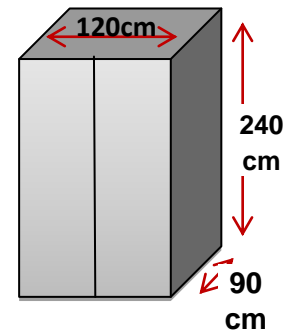
3. Down a school corridor, there are 100 lockers in a row. All lockers are initially closed and unlocked. 100 students will pass along this corridor, and they will change the position of the locker doors (open if closed, close if open) according to this specific sequence:

   - The 1st student changes the position of all doors
   - The 2nd student only changes the position of doors numbered 2,4,6,…
   - The 3rd student only changes the position of doors number 3,6,9,…
   - The 4th student only change the position of doors number 4,8,12,…
   - And so on, until the last student.

   After the 100th student has passed, which locker doors will remain open?

4. What is the area of the shaded square shown if the larger square has sides of length 1 and E,F, G and H are respectively the mid points of each of the four sides?
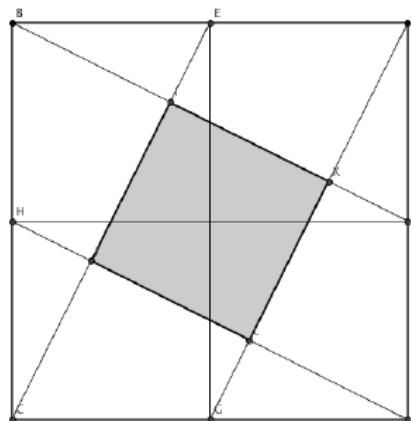
Answers on an A4 sheet with your <u>Name</u>, <u>Year</u> and <u>Class</u> should be handed into the box in the office before 4pm on Friday 28th of February

Monthly Prizes for both *Junior* and *Senior* Cycle.*

Good Luck.

Junior Cycle students only answer the circled questions; 1 and 2.