FEBRUARY 2016

DEPARTMENT OF MATHEMATICS

PROBLEM SOLVING CHALLENGE

Q1. *Junior Cycle*

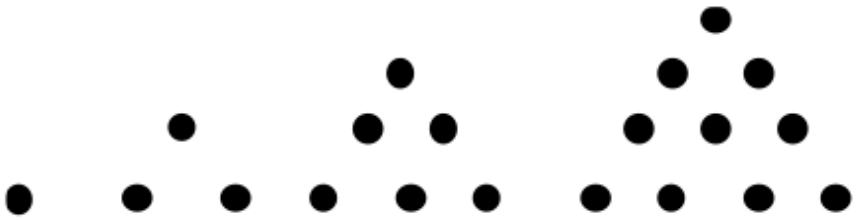
(a) The first four terms of a sequence are 1, 4, 2, and 3. Beginning with the fifth term in the sequence, each term is the sum of the previous four terms. Therefore, the fifth term is 10. What is the eighth term?

(b) Can you find a rule to describe numbers in the sequence; 101, 104, 109, 116, …

Find the next four terms in the sequence

Q2. *Senior Cycle*

(a) Show the next three patterns in the series:



Show that the sum of two consecutive patterns is a perfect square.

(b) A number is said to be handsome if it can be written as the sum of its digits written to some power. Thus 24 is handsome as $24 = 2^3 + 4^2$. Show that 43,63,89 and 132 are handsome[5].

Answers on an A4 sheet with your Name, Year and Class should be handed into the office or given to Mr. McEvoy before 4pm on Friday 26th of February

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

Good Luck.

Junior Cycle students answer question 1 only. *Senior Cycle students answer question 2 only*