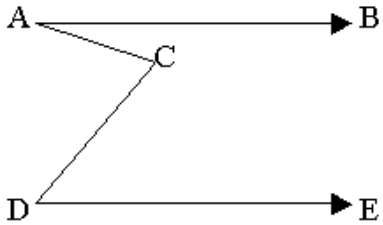
Department of Mathematics

PROBLEM SOLVING CHALLENGE

April/May 2014

1. If the ratio of the angles of a triangle is 1:2:3, which of these could be the smallest angle? What type of triangle is this?

2. [AB] and [DE] are parallel. The Angle BAC=30° and the angle CDE=50°. What is the size of the angle ACD?



3. In one night 3 poachers catch 8 rabbits, 16 pheasents and 10 trout respectively. Each poacher gives two of their catch to the two other poachers as a gift. When they put all of their remaining catch plus the gifts from the other poachers on a table, the total value of each catch is the same. If one Pheasent has a value of €10, what is the value of one rabbit and the value of one trout?

4. In this exercise, four cards are laid out on a table. Each card has a letter on one side and a number on the other side. The sides of the cards that we can see read: "**7**", "**S**","**5**" and "**J**".

   An unreliable source told us that whenever a "**7**" is on one side of a card, an "**S**" is on the other side. The task of this puzzle, is to check if this unreliable source is telling the truth. However, you can only turn over two cards. So, which two cards should you turn over?

5. A 3 by 4 rectangle is inscribed in circle. What is the circumference of the circle?

6. A line has equation $y = 3x + 5$. Show that the distance from $(1,2)$ to any point on the line is given by:

   $d = \sqrt{(x-1)^2 + (y-2)^2}$ and show that

   (a) $d^2 = (x-1)^2 + (3x+3)^2$
   (b) $d^2 = 10x^2 + 16x + 10$
   (c) Show that the minimum value for d is $\frac{3}{5}\sqrt{10}$

Answers on an A4 sheet with your Name, Year and Class should be handed into the box in the office before 4pm on Friday 9th of May

Monthly Prizes for both Junior and Senior Cycle.*

Good Luck.

Junior Cycle students only answer the circled questions; 1, 2 and 3.