MATHEMATICS - ORDINARY LEVEL - PAPER 1 (300 marks)

THURSDAY 12 JUNE - MORNING 9.30 a.m. to 12 noon.

Attempt **QUESTION 1** (100 marks) and **FOUR** other questions (50 marks each).

Marks may be lost if all necessary work is not clearly shown.
Mathematics Tables may be obtained from the Superintendent.

1.   (i)   Find the total cost of :

           4 tins of beans @ 34p per tin
           3 packets of soup @ 27p per packet
           5 bottles of soda water @ 45p per bottle.

     (ii)   A train leaves Dublin at 1125 hours and arrives in Killarney at 1439 hours. How many hours and minutes does the journey take ?

     (iii)   If $\pi r^2 = 616$, find the value of r.
           Take $\pi = \dfrac{22}{7}$.

     (iv)   Find the mean of the numbers
           2.8,   5.7,   3.5,   4.2,   2.9,   1.3.

     (v)   If $x = 4$, find the value of

$$x^2 + 9\sqrt{x} - 16.$$

     (vi)   A function f is $x \rightarrow 3x - 8$.
           Find the value of $f(3) + f(-3)$.

     (vii)   Factorise
$$x^2 - 3x - 28.$$

     (viii)   Write out all the values of x for which
$$x - 6 < 9 - 2x, \quad x \in \mathbf{N}.$$

     (ix)   Multiply 2700 by 0.4 and express your answer in the form $a \times 10^n$, where $1 \le a < 10$ and $n \in \mathbf{Z}$.

     (x)   IR£560 is divided between A, B and C so that A gets twice as much as B and C gets twice as much as A. How much does each receive ?
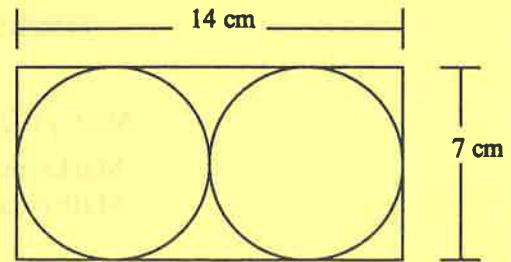
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2.   (a)   IR£1200 is invested at the rate of 5% per annum compound interest.
Calculate the amount at the end of 2 years.

(b)   Calculate the area enclosed by a circle of radius length 3.5 cm, taking $\pi = \dfrac{22}{7}$.

A rectangular piece of cardboard measures
14 cm by 7 cm.
Two circular pieces, each of radius length 3.5 cm,
are cut out from this rectangular piece
of cardboard as shown.

14 cm

7 cm

(i)   Calculate the area of the remaining piece of cardboard.

(ii)   Express the area of the remaining piece of cardboard as a percentage of the area of the original rectangular piece.
Give your answer correct to two places of decimals.

3.   (a)   Solve for x:

$$2(x - 4) = 5 .$$

(b)   Factorise

(i) $5ap + px - 5aq - qx.$

(ii) $x^2 - y^2.$

(c)   (i)   Divide $x^3 - 4x^2 + x + 6$ by $x + 1$.

(ii)   Solve for x in $5x^2 - 3x = 2x^2 + 6.$

4.

In a survey, 20 people were asked how much money each spent in a month on the National Lottery. The result, in IR£, was

6	6	4	6	7
6	6	5	4	6
7	5	6	7	6
5	6	6	5	5

Copy the following frequency table into your answerbook and complete it:

Amount in IR£	4	5	6	7
Number of people	2			

(i) State the amount of money which is the mode.

(ii) What percentage of the 20 people spent IR£6 or more ?

(iii) Calculate the mean amount of money spent per person.

(iv) Draw a pie-chart to show the contrast between the numbers of people who spent IR£4, IR£5, IR£6 and IR£7.

5.

Draw the graph of the function f :

$$x \rightarrow x^2 - 6x + 5$$

in the domain $0 \leq x \leq 6$.

Use your graph to estimate,

(i) the value of $f(2.5)$

(ii) the values of x for which $f(4) + f(x) = f(1) + f(3)$.

6.   (a)   Express q in terms of r and p when

$$\frac{q + r}{2} = p.$$

(b)   A = {1, 2, 3, 4, 5},   B = {3, 4, 5, 6} and C = {4, 5, 6, 7}.

Write the elements of

(i)   A ∩ B

(ii)   (A ∪ B) \ C.

What is # [(A ∪ B) \ C]?

(c)   Express as a single fraction

$$\frac{1}{x - 2} - \frac{1}{x}.$$

Hence, or otherwise, solve the equation

$$\frac{1}{x - 2} - \frac{1}{x} = \frac{1}{12}.$$