# AN ROINN OIDEACHAIS

SAMPLE PAPER

INTERMEDIATE CERTIFICATE EXAMINATION, 1990

### MATHEMATICS — SYLLABUS B — PAPER 1 (300 marks)

(TIME 2¹/₂ HOURS)

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

1. (i) Find the total cost of:–
     5 litres of milk @ 36p per litre
     2 boxes of cornflakes @ 69p per box
     3 kilogrammes of sugar at 56p per kilogramme.

    (ii) Calculate the compound interest on IR£2700 for 2 years at 12% per annum.

    (iii) Calculate the value of $(7 \cdot 3)^2 + \sqrt{37 \cdot 21}$.

    (iv) Solve the equatiaon $3(x + 4) = 16$.

    (v) Write out all the values of x for which $2x - 7 < 2 - x$, where $x \in N$.

    (vi) Name the shaded areas in the following Venn diagrams.
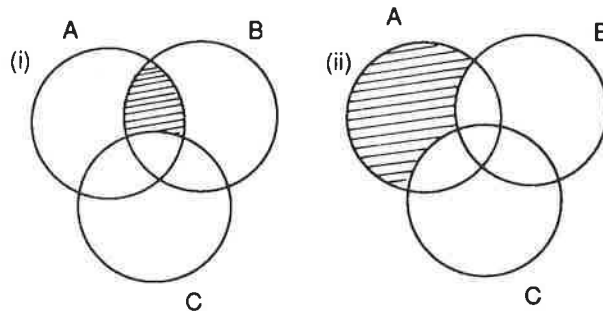
    (vii) Find the area of
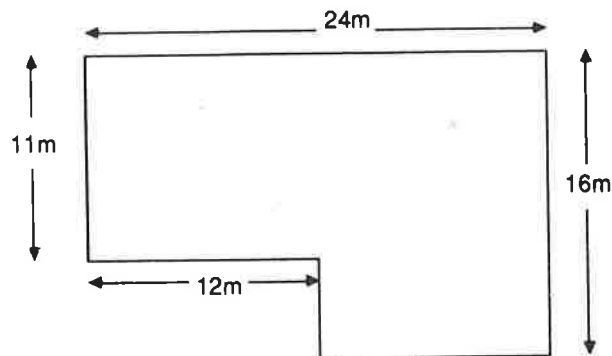
    (viii) f is the function $x \to 3x - 5$. Find $f(-1)$.

    (ix) Factorise $3x^2 - 4x - 4$.

    (x) IR£280 is divided between A, B and C so that B gets twice as much as A, and C gets twice as much as B. How much does each receive?

2. (i) A rod in the shape of a cylinder has a radius of length 0·4cm and a height of 8·4 cm.
        Calculate the volume of the rod, taking π to be $^{22}/_7$.

    (ii) Five rods, each of radius length 0·4cm and height 8·4cm, are to fit into a rectangular box of
         height 8·4cm. Find the capacity (internal volume) of the smallest box that will hold the rods.

    (iii) What is the difference in cm³ between the capacity of the box and the volume of the five rods?

3. (a) Factorise (i) $ax - by - ay + bx$.

            (ii) $7x^2 - 50x + 7$.

    (b) Solve for x:

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

4. (a) A and B are two sets such that $\#(A \cup B) = 15$ and $\#(A \cap B) = 3$. There are twice as many
         elements in A/B as there are in B/A. Find $\#(A)$.

    (b) The following table gives the rainfall in mm over a six month period:

Jan.	Feb.	March	April	May	June
260	120	85	70	45	40

Draw a bar chart to illustrate the data. What percentage of the total rainfall in the period fell in
the wettest three months?

5. (a) Find the value of x and the value of y in the simultaneous equations:

$$4x + 5y = 30$$

$$3x - 2y = 11.$$

    (b) A theatre with seating accommodation for 200 people took in IR£360 on a night when all the
         seats were sold.
         If seats were priced at IR£1·50 and IR£2·50, find how many of each price were sold.

6. Graph the function

$$f : x \rightarrow x^2 - 2x + 2$$

in the domain $-2 \leq x \leq 4$ for $x \in R$.

Using the graph, estimate the value(s) of

(i) $f(-1·8)$

(ii) x when $f(x) = 8$

(iii) x when $f(3) - f(1) = f(4) - f(x)$.