AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

JUNIOR CERTIFICATE EXAMINATION, 2000

MATHEMATICS - ORDINARY LEVEL

THURSDAY, 8 JUNE - MORNING, 9.30 to 12.00

PAPER 1 (300 marks)

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

Marks may be lost if necessary work is not clearly shown.

Mathematics Tables may be obtained from the Superintendent.

1. **(i)** Find the total cost of:

3 tins of peas @ 51p per tin

4 packets of biscuits @ IR£1.29 per packet

6 oranges @ 22p per orange.

(ii) A bus left Dublin at 0855 hours and arrived in Galway at 1225 hours. How many hours and minutes did the journey take?

(iii) VAT at 21% is added to a bill of IR£130. Calculate the total bill.

(iv) Using the Tables, pages 20-27, or otherwise, find the value of

$$(9.5)^2 - \sqrt{6.25}\,.$$

(v) Solve for x:

$$x^2 - 8x + 15 = 0\,.$$

(vi) Write the mode of the following list of numbers:

3, 1, 2, 1, 3, 2, 4, 3, 5, 3, 2, 3, 4, 3.

(vii) Express b in terms of a and c when $a + 4b = 3c$.

OVER →

(viii) Má tá $f(x) = 3 - 2x$, faigh an luach ar $f(4) + f(-1)$.

(ix) Taispeáin ar an uimhirlíne na luachanna ar x gur fíor ina leith

$$5x - 3 \geq x + 9, \quad x \in \mathbf{R}.$$

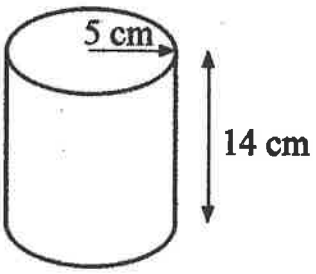
(x) Méadaigh 3800 faoi 0.4, agus réalaigh do fhreagra sa bhfoirm $a \times 10^n$, áit a bhfuil $1 \leq a < 10$ agus $n \in \mathbf{Z}$.

2. **(a)** Roinn IR£320 idir beirt duine sa chóimheas 3:5.

(b) Déantar IR£2400 a infheistiú ag an ráta 3% sa bhliain ús iolraithe. Ríomh an t-iomlán ag deireadh dhá bhliain.

(c) Faigh an toirt de dhlúthshorcóir ar fad ga dó 5 cm agus ar airde dó 14 cm.

Glac le $\pi = \frac{22}{7}$.



Is ar éigin is féidir dhá cheann de na sorcóirí sin a thoilleadh i mbosca dronuilleogach ar airde dó 14 cm.

Faigh

(i) an fad, x cm, den bhosca dronuilleogach.

(ii) an leithead, y cm, den bhosca dronuilleogach.

(iii) an toirt, i cm^3, den bhosca dronuilleogach.

3. **(a)** If $x = 4$, find the value of $x^2 - x + 5\sqrt{x}$.

(b) Factorise

(i) $xy + 4ay - xz - 4az$.

(ii) $3x^2 + 10x - 8$.

(c) **(i)** Solve for x and for y:

$$x + 2y = 10$$
$$2x - y = 5$$

(ii) Express as a single fraction $\frac{1}{4} - \frac{1}{9}$.

Express as a single fraction $\frac{1}{x-3} - \frac{1}{x+2}$.

4. The table shows the rainfall, in millimetres, recorded for a number of months during 1999, at a weather station.

Month	May	June	July	Aug.	Sept.	Oct.
Rainfall in mm	35	40	25	30	50	60

(i) Draw a trend graph of the data, putting months (May, June, etc.) on the horizontal axis.

(ii) Which month had the greatest rainfall?

(iii) Calculate, in mm, the mean rainfall per month.

(iv) Name the months in which the rainfall was greater than the mean.

(v) The rainfall for the above six-month period represents 40% of the total rainfall recorded at the weather station during all of 1999.

Calculate, in mm, the total rainfall recorded at the weather station during all of 1999.

OVER →

5. Using graph paper, draw the graph of the function

$$f : x \to x^2 - 2x - 4$$

in the domain $-2 \leq x \leq 4,\ x \in \mathbf{R}$.

(i) Draw the axis of symmetry of the graph of $f(x)$.

(ii) Use your graph to find the value of $f(x)$ when $x = 2.5$.

(iii) Use your graph to find the values of x for which $f(x) = 2$.

6. **(a)** Solve for x: $4(x-1) - 3(x-2) = 0$.

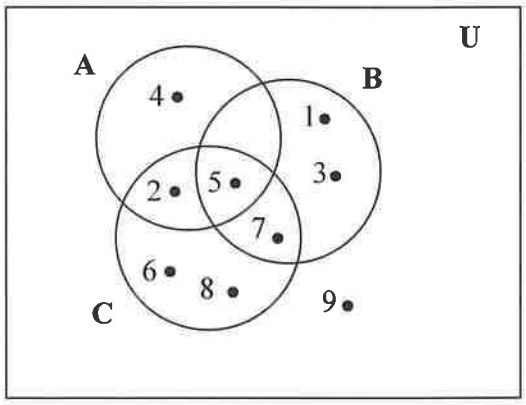
(b) List the elements in each of the following sets

(i) B

(ii) $A \cap C$

(iii) $A \setminus (B \cup C)$

(iv) $(A \cup B \cup C)'$.



(c) **(i)** Multiply $x^2 - 6x + 7$ by $2x - 3$.

(ii) Divide $x^3 + 5x^2 + 6x$ by $x + 3$.