

JUNIOR CERTIFICATE EXAMINATION, 1992

MATHEMATICS – ORDINARY LEVEL – PAPER 1 (300 marks)

THURSDAY 11 JUNE – MORNING 9:30 a.m. to 12 noon

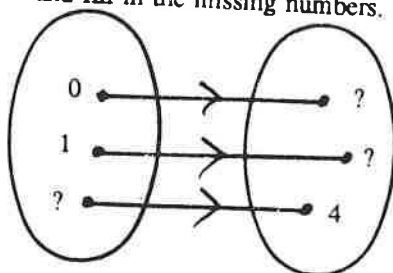
Attempt **QUESTION 1** (100 marks) and **FOUR** other questions (50 marks each).

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

- I. (i) IR£1040 was divided in the ratio 6 : 7 .
The larger amount was given to charity.
How much was this ?
- (ii) An airline ticket cost \$540. If IR£1 = \$1.8, calculate the cost of the ticket in IR£.
- (iii) $\pi r^2 = 1256$. Find r taking π to be 3.14.
- (iv) Solve for x if $\frac{3x - 1}{4} = \frac{2x - 3}{2}$.
- (v) Find the value of $(12.95)^2 - (12.05)^2$.
- (vi) Find b in terms of a and c when
 $3a - 4b = 2c$.
- (vii) A function is defined as

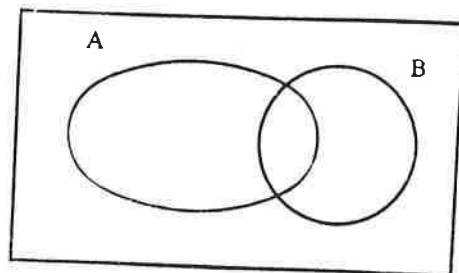
$$x \rightarrow 3x - 2$$

Copy the diagram and fill in the missing numbers.



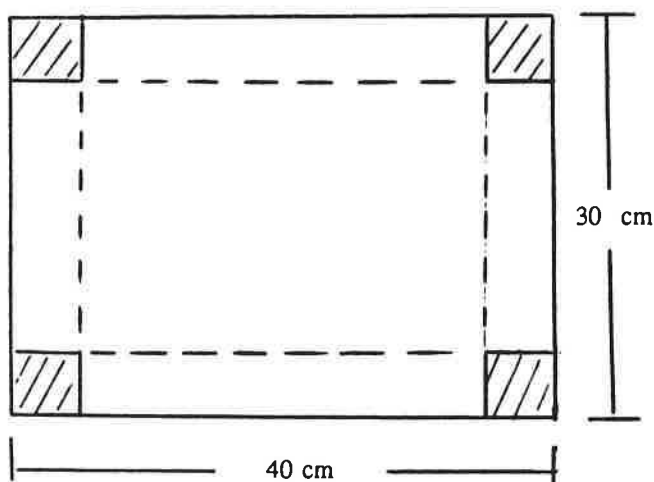
- (viii) When $x = -1$, find the value of $\frac{2}{2x - 3} - \frac{3}{3x - 2}$.

- (ix) Copy the Venn diagram into your answerbook and shade $(A \cup B)'$.



- (x) What natural numbers are there in $4 \geq 2x$?

2. A rectangular piece of plastic measured 40 cm by 30 cm. Squares of side 5 cm were cut off from the corners, as shown.



- (i) Find the area of the remainder in cm^2 .
- (ii) The strips at the edges were folded along the dotted lines so as to make an open rectangular box. How many litres of water will this box contain?
- (iii) A cube of edge-length 10 cm was placed carefully in the water so that a face of the cube was on the floor of the box. How much water, in litres, spilled out?

3. (a) Factorise

(i) $x^2 + 2px + qx + 2pq$.

(ii) $5x^2 - x - 18$.

(b) Solve for x in $3x^2 - 6x = x^2 - 4$

- (c) A record cost IR£1.50 more than a cassette. Four records and three cassettes cost IR£48. Find the cost of a record.

4. The table shows the number of cars bringing pupils to school on a certain morning and the number of pupils per car. There were 12 cars, for example, each bringing one pupil.

| | | | | | |
|----------------------------|----|----|----|---|---|
| Number of pupils per car | 1 | 2 | 3 | 4 | 5 |
| Frequency (number of cars) | 12 | 22 | 14 | 8 | 4 |

- (i) How many pupils in total came to school by car that morning?
- (ii) Calculate the mean number of pupils per car.
- (iii) How many pupils altogether came to school on that morning if 30% of them had come by car?

In a pie chart contrasting the number who came by car with the number who came otherwise, what size of angle at the centre would represent the car travellers? Draw an accurate pie-chart to show the contrast.

5. Draw the graph of the function:

$$x \rightarrow x^2 - 6x + 9$$

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

Take the graph to represent the speed of a stone thrown straight up into the air.

The speed in m/s is shown on the Y axis and the time in seconds is shown along the X axis.

Use the graph to find how many seconds after the throw

- (i) was the speed of the stone equal to 6 m/s ?
- (ii) did the stone begin to fall back down ?

6. A tuck-shop in a school sold only three items: crisps (A), sweets (B), and soft drinks (C). 40 pupils spent money in the shop one morning and

10 bought crisps and sweets,
12 bought crisps and soft drinks,
8 bought crisps only and 3 bought sweets only.

No one bought all three items.

Twice as many bought crisps as bought sweets.

Enter this data in a Venn diagram.

How many

- (i) bought soft drinks only ?
- (ii) bought two items only ?

Show in detail how you arrived at the last two answers.

