

JUNIOR CERTIFICATE EXAMINATION, 1993

**MATHEMATICS - ORDINARY LEVEL - PAPER 1 (300 marks)**

35697

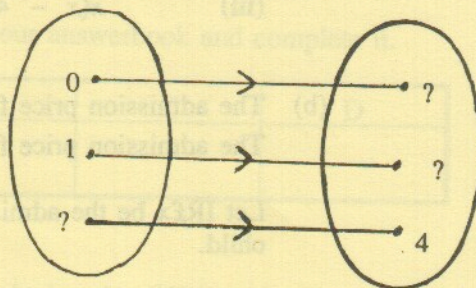
THURSDAY 10 JUNE - MORNING 9.30 a.m. to 12 noon.

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) V.A.T at 15% is added to a bill of IR£80.  
Find the total cost.
- (ii) The total attendance at a concert over two nights was 450. The nightly attendances were in the ratio of 2 : 3.  
Find the attendance on the first night.
- (iii) A train departed Kildare at 1045 hours and arrived in Mallow at 1307 hours.  
How many hours and minutes did the journey take ?
- (iv) Factorise  $x^2 - 9$ .  
Using this result or otherwise, simplify  $\frac{x^2 - 9}{x - 3}$  when  $x$  is not 3.
- (v) Find the value of  $\frac{1}{(0.25)^2}$
- (vi) What is the mean (average) of 1.1, 1.8, 2.3, 3.5, 4.1, 5.2 ?
- (vii)  $f$  is the function  $x \rightarrow 2x + 3$

Copy the diagram into your answerbook and fill in the missing numbers.



- (viii) Factorise

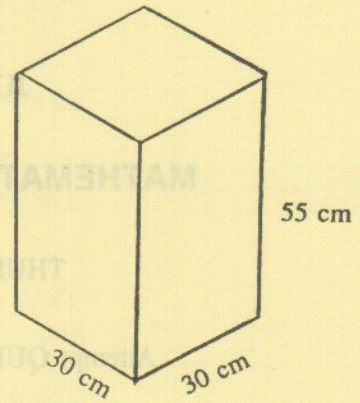
$$ax + 4a + px + 4p$$

- (ix) When  $x = -2$  and  $y = 3$ , find the value of  $\frac{5x + y^2}{-2y}$
- (x) Find the value of  $\frac{4}{3}\pi r^3$  when  $r = 3$ .  
Take  $\pi = 3.14$  and give your answer correct to the nearest whole number.

OVER →

2.

- (i) Find the volume in  $\text{cm}^3$  of a cylindrical cup of radius 3 cm and height 7 cm, taking  $\pi = \frac{22}{7}$ .



- (ii) A fish tank has a square base measuring 30 cm by 30 cm. It has four rectangular sides, each 55 cm high. Find the volume of the tank in  $\text{cm}^3$ .

- (iii) The cylindrical cup is filled with water and then totally emptied into the fish tank. This is done 50 times. What is the total volume of water put into the fish tank?

If the fish tank was empty at the start, what is the depth of water in it at the end?

3.

- (a) A person borrows IR£4000 at the rate of 13% per annum compound interest. How much does the person owe at the end of two years?

(b) (i) Divide  $x^3 + 2x^2 - 2x - 3$  by  $x + 1$ .

(ii) Multiply  $x^2 + xy + y^2$  by  $x - y$ .

4.

- (a) Solve for  $x$ :

(i)  $3(x - 1) - 2(x + 1) = 6$ .

(ii)  $x^2 - 4x - 12 = 0$

(iii)  $x(x - 4) = 0$

- (b) The admission price for two adults and six children to a concert is IR£18. The admission price for six adults and two children to the concert is IR£30.

Let IR£ $x$  be the admission price for an adult and let IR£ $y$  be the admission price for a child.

Write down two equations, each in  $x$  and  $y$ , to represent all the above information.

Solve the equations simultaneously to find the admission price for an adult.

5.

Draw the graph of the function

$$x \rightarrow x^2 - 4x + 5$$

in the domain  $-1 \leq x \leq 5$ .

The graph shows the wind-speed at hourly intervals.

The x-axis shows one hour intervals e.g.  $x = 0$  means midnight;  $x = 1$  means 1 a.m. etc.

The y-axis shows the wind-speed in kilometres per hour e.g.  $y = 0$  means calm;  $y = 1$  means 10 km/hr etc.

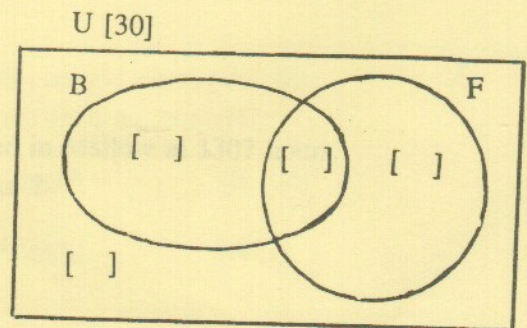
Use your graph to find

- (i) the times when the wind-speed was 32 km/hr;
- (ii) the speed of the wind at 4.45 a.m.

6.

- (a) In a class of 30 pupils,  
18 play basketball (B)  
14 play football (F)  
2 play neither.

Copy the Venn diagram into your answerbook and complete it.



- (b) 24 students were surveyed to find which of four games A, B, C, D was their favourite. The result was

A	C	B	C	A	C
B	A	C	B	C	C
C	C	B	A	C	A
D	C	D	C	A	C

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

Game	A	B	C	D
Number of pupils				

Draw a pie chart contrasting the numbers playing the different games, stating clearly the size of the angles at the centre.