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JUNIOR CERTIFICATE EXAMINATION, 1995

MATHEMATICS - ORDINARY LEVEL - PAPER 1 (300 marks)

THURSDAY 8 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.

1. (i) IR£250 was invested for a year at 2.5% per annum. Find the interest.

(ii) On a day when 9.6 French Francs = IR£1, find the value in IR£ of 480 French Francs.

(iii) When $x = \frac{y - 2z}{3}$, express z in terms of x and y.

(iv) Find the value of

$$\sqrt{(3\ 1/4)^2 - 9}\ .$$

(v) Solve for x and y

$$2x - 2y = 2$$
$$2x + 2y = 12.$$

(vi) Find the least natural number that satisfies $x - 3 > 2$.

(vii) A function f is $x \rightarrow x - 6$.
Fill in the missing numbers in these two couples of f: (11, ?), (?, 0).

(viii) Write the mode of the following:
1, 2, 3, 4, 5, 4, 3, 2, 1, 2, 3, 4, 5, 4.

(ix) Write (1.234×10^4) as a natural number.

(x) Factorise

$$6xy + 3y^2.$$

2. Find, in terms of π, the volume of liquid in a large cylinder of radius length 10 cm and height 15 cm.

Calculate the number of small cylinders of radius length 5 cm and height 7 cm that can be filled from one supply of liquid in the large cylinder.

What height of liquid was then left in the large cylinder?

3. (a) Solve for x :

$$\frac{3x-1}{2} - \frac{x}{4} = \frac{1}{2}.$$

(b) Factorise

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

(ii) $x^2 - 16y^2$.

(c) Five persons shared equally the cost, IR£ x, of a taxi fare to a disco.
Four of them shared equally the cost, IR£$(x - 4)$, taking them home.
For the *four* that went and came home by taxi, the total cost was IR£3.95 each.

Write an equation in x to show this information and find the value of x.

4. (a) Solve for x : $x^2 - 12x + 35 = 15$.

(b) The table shows the number of newspapers sold per day in a shop from Monday to Saturday:

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Number of newspapers sold	50	25	20	35	50	60

(i) Show the data on a barchart.

(ii) Calculate the mean daily sales.

(iii) The profit on a newspaper is 15p. Find the mean daily profit on newspaper sales.

(iv) If the mean daily sale of newspapers for the seven-day week was 47, calculate the number of newspapers sold on Sunday.

5. Draw the graph of the function f

$$x \rightarrow x^2 - 6x + 10$$

in the domain $0 \leq x \leq 4$.

Use the graph to estimate, or otherwise find,

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

(ii) the value of x when $f(x) = 2.5$.

Let the graph represent the speed of a high-board diver after entering water.
The seconds under water are shown on the x axis.
The diver's speed at any given second is shown on the y or $f(x)$ axis.

(iii) Find the value of x when the diver's speed is greatest.

(iv) How many seconds after entering the water does the diver's speed begin to increase?

6. (a) How many numbers of the set { 1, 2, 3, ... 98, 99, 100} are divisible with no remainder by

(i) 3 (ii) 3^2

(iii) 3^3 (iv) 3^4 ?

(b) P = { 1, 2, 3, 4 }, Q = {2, 3, 4, 5,} and R = { 3, 4, 5, 6}.

Write the elements of

(i) $P \setminus (Q \cup R)$

(ii) $(P \cap Q) \setminus R$.

(c) All 22 pupils in a class took part in the long (L) or the high (H) jump in a sports. 16 took part in the long and 12 took part in the high jump.

If # (L $\cap$ H) = x, write an equation in x and find the value of x.