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JUNIOR CERTIFICATE EXAMINATION, 2001

MATHEMATICS – ORDINARY LEVEL

THURSDAY, 7 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 in IR£ of

   3 cans of orange at 55p per can

   4 chocolate bars at 28p per bar

   2 bags of crisps at 23p per bag.

(ii) A bus travels a distance of 75 km in one hour thirty minutes.

   Find the average speed of the bus in km per hour.

(iii) Simplify:

$$\frac{2}{5} \div \frac{4}{5} + \frac{3}{4}.$$

(iv) Find the mean of the six numbers :

   1.2, 2.8, 3.6, 4.3, 5.7, 6.4

(v) A function f is $x \rightarrow 2x - 1$.
   Find the value of $f(2) + f(-1)$.

(vi) Solve the simultaneous equations:

$$2x + 3y = 12$$
$$2x - y = 4.$$

(vii)   Express c in terms of a and b when $2c - b = a$.

(viii)   Write out all the values of x for which
$$2x - 3 < 2 + x, \quad x \in \mathbf{N}.$$

(ix)   Write down the factors of
$$x^2 - 4x - 21.$$

(x)   Multiply 324.4 by 2.5.

Express your answer in the form $a \times 10^n$, where $1 \le a < 10$ and $n \in \mathbf{Z}$.

2.   **(a)**   John is 15 years old. Mary is 10 years old.

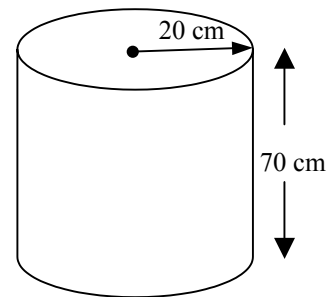IR£50 is shared between them in the ratio of their ages.

How much does each of them receive?

(b)   IR£2000 is invested for two years at 4% per annum compound interest. How much interest is earned?
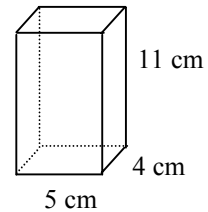
(c)   **(i)**   A cylindrical drum full of milk has radius 20 cm and height 70 cm.

Find its volume in cm^3.

Take $\pi = \dfrac{22}{7}$.

(ii)   Find the volume of a rectangular carton measuring 5 cm by 4 cm by 11 cm.

(iii)   How many of these cartons can be filled using all the milk from the drum?

3. **(a)** When $a = 3$ and $b = 2$ find the value of

$$\frac{2a^2 - 5b}{4b - 2a}.$$

(b) Factorise :

(i) $2ax + ay + 2bx + by$

(ii) $x^2 - 16.$

(c) (i) Multiply $2x^2 - x + 1$ by $x - 2$.

(ii) Anne has IR£x. Jim has IR£4 more than Anne.

They have IR£16 in total.

Write an equation in x to show this information.

Solve the equation to find how much money Anne has.

4. All the families living in a certain street are surveyed to find how many children are in each family. The results of the survey are shown in the frequency table below. For example, 3 families have 1 child each.

Number of children per family	1	2	3	4	5	6
Number of families	3	5	7	9	4	2

(i) Using graph paper, draw a bar chart to show this information.

Put the number of children per family on the horizontal axis.

(ii) How many families live in the street?

(iii) Calculate the mean number of children per family.

(iv) Write down the modal number of children per family.

(v) What percentage of families in the street have more than 4 children?

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

$$f : x \rightarrow x^2 - 4x + 3$$

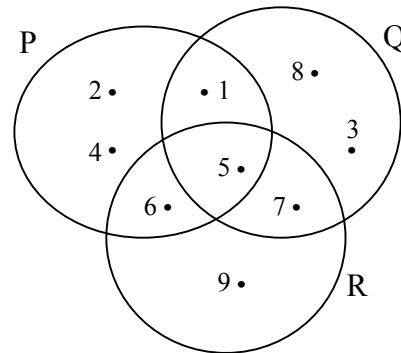in the domain $-1 \leq x \leq 5$, $x \in \mathbf{R}$.

Use your graph to find

(i) the value of $f(3.5)$

(ii) the values of x for which $f(x) = 0$

(iii) the minimum value of $f(x)$.

6. **(a)** Solve for x:

$$2(x - 3) = 10.$$

(b) The elements of the sets P, Q and R are shown on the Venn diagram.

(i) List the elements of

P \ Q.

(ii) List the elements of

$(P \cup R) \cap Q$.

(iii) Name the set whose elements are 5 and 6.

(c) Solve for x:

$$\frac{1}{x - 4} - \frac{1}{x} = \frac{1}{8}.$$