

AN ROINN OIDEACHAIS  
INTERMEDIATE CERTIFICATE EXAMINATION, 1991

M.43

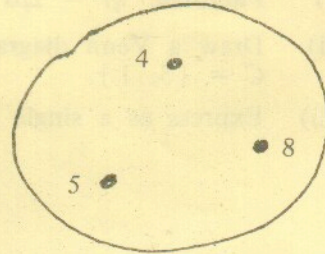
MATHEMATICS – SYLLABUS B – PAPER I (300 marks)

THURSDAY, 6 JUNE – MORNING, 9.30 to 12.00

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

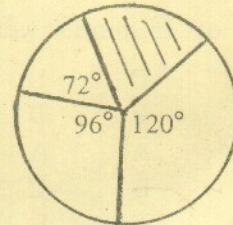
Marks may be lost if all your work is not clearly shown  
Mathematics Tables may be obtained from the Superintendent

1. (i) Find the value of  $\frac{11.3 + 4.1}{1.1}$ .
- (ii) Find, correct to the nearest penny, the compound interest on IR£100 for two years at  $12\frac{1}{2}\%$  per annum.
- (iii) Using the Tables, P.20–27, or otherwise, find the value of  $\frac{4}{(2.34)^2}$ .
- (iv) Find the radius of a cylinder, taking  $\pi = 3.14$ , if the curved surface area is  $314 \text{ cm}^2$  and the height 5 cm. (See Tables P.7.)
- (v) Copy the diagram, and graph the couples of the relation  $\geq$  on the elements of the set.



- (vi) Solve for  $x$  in  $x^2 - 6x - 16 = 0$ .
- (vii) Solve the simultaneous equations  
 $x + 3y = 6$   
 $x - y = 0$
- (viii) When  $x = \frac{y + t}{2}$ , express  $t$  in terms of  $x$  and  $y$ .

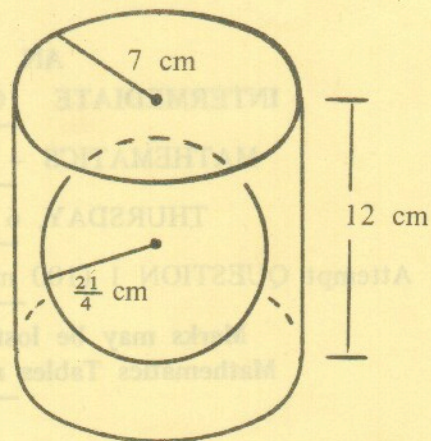
- (ix) The pie chart represents 30 people. How many are represented by the shaded portion?



- (x) A train departed Cork at 1150 hr and arrived in Dublin at 1403 hr. How many hours and minutes did the journey take?

OVER →

2. A machine part consists of a hollow sphere floating in a closed cylinder full of oil. The height of the cylinder is 12 cm; the radius of the cylinder is 7 cm and the radius of the sphere is  $\frac{21}{4}$  cm.



Taking  $\pi$  to be  $\frac{22}{7}$ , find the volume of

- (i) the cylinder  
 (ii) the sphere  
 (iii) the oil.
3. (i) Multiply  $2x^2 - 2x + 1$  by  $x + 1$ .  
 (ii) Simplify  $3(x + 4) - 5(2x + 3) + 2(5x - 6)$  and then find its value when  $x = 5$ .  
 (iii) Find three factors of  $2x^2 - 8$ .

4. (i) Factorise  $qr - 2ps - 2qs + pr$ .  
 (ii) Draw a Venn diagram to illustrate the sets  $A = \{1, 2\}$ ,  $B = \{2, 3\}$ ,  $C = \{3, 1\}$ .  
 (iii) Express as a single fraction  $\frac{1}{x-1} - \frac{1}{x+9}$

5. Draw the graph of the function  $x \rightarrow 4 + x^2$  in the domain  $-2 \leq x \leq 2$ .

Assume the graph shows the time of sunset from the month of October until February.

Take  $-2$  on  $X$  axis to be Oct. 1st.

Take  $-1$  on  $X$  axis to be Nov. 1st etc.

On the other axis, take 4 to be 4 p.m., 5 to be 5 p.m. etc.

Estimate, using the graph,

- (i) the time of sunset in mid-December.  
 (ii) the months in which sunset occurs at 6.30 p.m.
6. A class of 25 pupils were given the following grades in a test:

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

- (i) State the grade which is the mode.  
 (ii) Construct a frequency table:

Grade	A(93)	B(77)	C(62)	D(47)	E(32)
Number of pupils					

- (iii) and calculate the mean mark per pupil if  $A$  is exactly 93 marks,  $B$  is exactly 77 marks etc., as shown.