

AN ROINN OIDEACHAIS

M.46(a)

INTERMEDIATE CERTIFICATE EXAMINATION, 1983

MATHEMATICS - LOWER COURSE - PAPER II (150 marks)

MONDAY, 13 JUNE - MORNING, 9.30 to 12.00

Examination Number

SECTION A (45 marks)

Attempt all questions. You should not spend more than 45 minutes on this section.
Answer each question by writing one of (a), (b), (c), (d) in the box under each question number.
If you wish to change an answer, cross out your first choice and write your new answer near the box.

Mathematical tables may be obtained from the Superintendent.

THIS PAPER MUST BE ENCLOSED IN YOUR ANSWER BOOK

1. 3×10^{-3} is
 (a) 0.3 (b) 0.03 (c) 0.003 (d) -9

2. $111_2 + 111_2 + 111_2$ is
 (a) 10100_2 (b) 10101_2 (c) 100101_2 (d) 11101_2

3. $\frac{2.2 \times 4.4}{0.11}$ is
 (a) 88 (b) 8.8 (c) 0.8 (d) 880

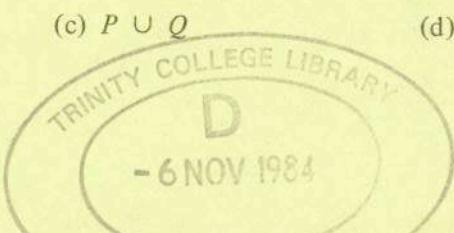
4. $\frac{2.2 + 4.4}{0.11}$ is
 (a) 0.6 (b) 6 (c) 60 (d) 600

5. If $p + q = 2r$, then $\frac{p + q + r}{3}$ is
 (a) r (b) $3r$ (c) $\frac{2r}{3} + r$ (d) $\frac{2r^2}{3}$

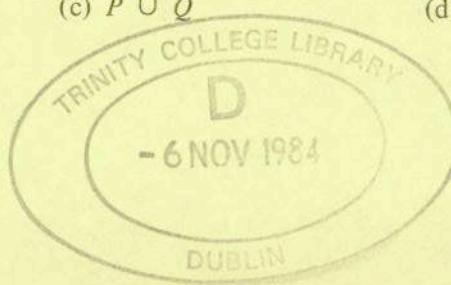
6. $\frac{4}{5}$ is equal to
 (a) 20% (b) 80% (c) 60% (d) 40%

7. $P = \{3, x, k\}$, $Q = \{3, y\}$. Which one of the following is a subset of P ?
 (a) Q (b) $Q \setminus P$ (c) $P \cup Q$ (d) $P \cap Q$

8. $(x + 3)(x - 7)$ is
 (a) $x^2 - 21$ (b) $x^2 - 4x - 21$
(c) $x^2 + 4x - 21$ (d) $x^2 - 4x + 21$



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9. The n th term of a sequence is $n^2 - n - 1$. Then 5 is the
 (a) first term (b) second term (c) third term (d) fourth term
10. If $x(x - 5) + 1$ is divided by $(x - 5)$, the remainder is
 (a) x (b) 1 (c) $\frac{1}{x - 5}$ (d) 0
11. The least number of coins which amount to 37p is
 (a) 4 (b) 5 (c) 6 (d) 7
12. $(-1)^3$ is
 (a) -1 (b) 1 (c) 3 (d) -3
13. The mode of 1, 5, 1, 4, 7, 6, 4, 1, 5, 2 is
 (a) 1 (b) 4 (c) 36 (d) 3.6
14. The domain of the function $\{(3, 8), (2, 5), (1, 1), (2, 4)\}$ is
 (a) {} (b) {1, 4, 5, 8} (c) {1, 2, 3} (d) {1, 2, 3, 4, 5, 8}
15. If $3(x - 1) < 5(x + 6)$, then x could not be
 (a) 0 (b) -13.5 (c) 8 (d) -20

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MONDAY, 13 JUNE - MORNING, 9.30 to 12.00

SECTION B (105 marks)

Attempt **QUESTION 1** (30 marks) and **THREE** other questions (25 marks each)

Marks may be lost if all your work is not clearly shown

1. (a) IR£1500 was invested for two years at compound interest. The rate for the first year was 12% and for the second year 13%. Calculate the total interest.
- (b) The following table shows some of the findings from a survey of 534 pupils:

	Boys	Girls	Total
Pupils with spectacles	30	25	
Pupils without spectacles		196	
Total			534

Copy the table and fill in the total number

- (i) of girls in the school
- (ii) of boys in the school.

Fill in the other blanks.

2. (i) Evaluate $\frac{2x(x-y)}{5y^2(x+y)}$
when $x = 2, y = -1$.

(ii) Divide $2x^3 - 9x^2 + 11x - 3$ by $2x - 3$

- (iii) Express as a single fraction

$$\frac{1}{x-4} - \frac{1}{x}$$

3. Factorise

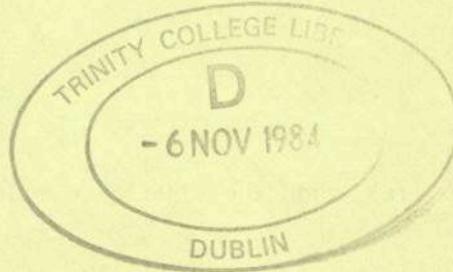
(i) $ac - 2bd + 2ad - bc$

(ii) $3x^2 - 8x + 4$

(iii) $2x^2 - 8$

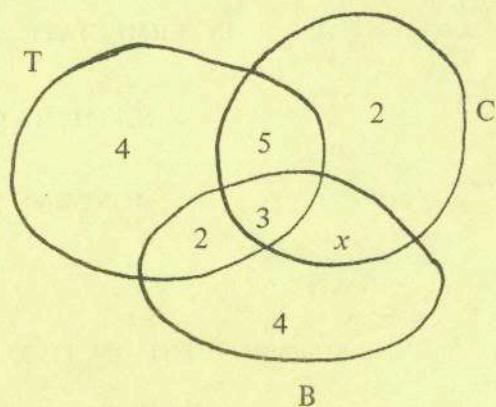
Solve the equation

$$3x^2 - 8x + 4 = 2x^2 - 8.$$



4. The Venn diagram shows the numbers of pupils in a class who play one or more of the games basketball (B), chess (C), tennis (T)

- How many play one game only ?
- If 14 play two games only, write down the value of x .
- If there are 32 pupils in the class, how many do not play any of the games ?
- Find $\# [T \setminus (C \cap B)]$
- Substitute one of \cup , \cap , \setminus for each question mark, so that,
 $\# [T ? B ? C] = 2.$



5. Graph the function

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

in the domain $-2 \leq x \leq 3$, $x \in \mathbb{R}$.

For what value(s) of x is

- $f(x) = 0$
- $f(x)$ greatest
- $f(x) = 3$.

6. In a class of 40, each pupil had a bicycle. Only four makes of bicycle, A, B, C, D had been bought. A pie-chart was drawn to illustrate the information.

This table shows some of the data:

Make of bicycle	A	B	C	D
Number of bicycles			10	8
Angle of pie-chart	90°	108°		

Fill in the blank spaces in a table in your answer-book.

Draw the pie-chart.

7. (a) Find the value of x and the value of y , if

$$x + 2y = 7$$

$$3x + 5y = 20.$$

(b) There are two schools A and B.

In school A the number of girls and the number of boys add up to 315.

In school B there are twice as many girls as in A and three times as many boys as in A and school B has 748 pupils.

How many (i) girls (ii) boys in school A ?