

AN ROINN OIDEACHAIS.

AN BRAINSE GAIRM-OIDEACHAIS.

CERTIFICATE EXAMINATIONS

for

DAY VOCATIONAL COURSES, 1954.

MATHEMATICS.

Tuesday, June 22nd—10 to 1 p.m.

INSTRUCTIONS.

- (a) Attempt Question 1 and six others.
 - (b) The marks allotted to each question are shown in brackets under.
 - (c) Mathematical Tables are supplied.
 - (d) Special credit will be given to candidates who display neatness and order in answering.
 - (e) All the work must be shown in the answer book.
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1. (a) Simplify : $\frac{1}{3} + \frac{3}{4} \times \frac{1}{5} - \frac{1}{6} \div \frac{2}{3}$.

(b) Find the value of $\frac{0.7413}{0.05056}$ correct to three significant figures.

(c) Simplify : $3b - [5a - \{6a + 2(10a - b)\}]$.

(d) If 454 grams = 1 lb., how many tons in 12712 kilograms.

(e) Factorise the following : $6x^2 - 31x + 35$. [20 marks.]

2. The length and breadth of a rectangle were measured as 2.5 feet and 1.2 feet respectively. It was later found that their actual lengths were 2.52 feet and 1.17 feet respectively. Find the percentage error in the area of the rectangle in using the first measurements of length and breadth.

[10 marks.]

3. Find the volume, in cubic feet, of metal in six pipes, each having the following dimensions: 17 ft. 6 in. long, 8 in. internal diameter, and $\frac{1}{2}$ in. thickness of metal ($\pi=3\frac{1}{7}$). [10 marks.]

4. (a) Write down, from the tables supplied, the logarithms of the following numbers:

44.53, 1.001, 0.0092.

(b) If $k = \frac{AB^3}{\sqrt{C}}$, find, using logarithms, the value of k if $A=87.66$, $B=0.3793$ and $C=2.540$.

[10 marks.]

5. Solve the following equation by the method of factors and by the method of completing the square:

$$x^2 - 5x - 36 = 0.$$

[12 marks.]

6. From the formula $A = \pi\{(r+t)^2 - r^2\}$ express r in terms of the other symbols. Hence find the value of r when $A=66$, $t=1$ and $\pi=3\frac{1}{7}$.

[12 marks.]

7. A certain company selling articles on the hire purchase system makes its calculations as follows:—

“To the cash price of the article add simple interest on it for 3 years at 5%. One-tenth of this total is the initial deposit. After subtracting the deposit, divide the remainder by 36 to get the amount of each monthly instalment.”

If the cash price of an article is £40, what is the value of each monthly instalment?

[14 marks.]

8. (a) Prove that a line drawn through two sides of a triangle and parallel to the third side gives a small triangle similar to the large one.

(b) Divide a line PQ, 4 inches long, into seven equal parts. Explain your method.

[14 marks.]

9. In an experiment to find the relationship between two quantities, denoted by x and y , the following values were obtained :—

x	0.2	1.0	1.6	3.0	4.4	6.0
y	8.7	7.5	6.6	4.5	2.4	0

Plot a graph of these figures and from it determine the value of y when $x=2.0$.

If the relationship between x and y is given by the equation $y = -1.5x + C$, find the value of C from the graph.

[14 marks.]

10. The triangle ABC represents the top portion of the gable end of a certain house. Calculate the magnitude of the angle ACB and the width BC of the house.

[14 marks.]

