

BRAINSE AN GHAIRMOIDEACHAIS

CERTIFICATE EXAMINATIONS

for

DAY VOCATIONAL COURSES, 1961

MATHEMATICS.

Thursday, 22nd June—10 to 1 p.m.

INSTRUCTIONS.

- (a) Attempt Question 1 and *six* others.
- (b) The marks allotted to each question are shown in brackets.
- (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.

1. (a) Simplify : $1\frac{7}{24} - \frac{2}{3} \left(\frac{2\frac{1}{7} + 1\frac{1}{2}}{3\frac{1}{6} - \frac{3}{4}\frac{1}{2}} \right)$

(b) Without using logarithms, evaluate correct to three significant figures : $\frac{19.9 \times 20.1}{(5.5)^2 - (2.5)^2}$

(c) Calculate the cost of 9 tons 12 cwt. of coal at £8 7s. 6d. per ton.

(d) the area of the inside of a box is given by $A=2D(L+B)+LB$. Re-arrange this equation to give L in terms of A, B and D and find the value of L when $A=47$, $B=3$ and $D=2$.

(e) A bought a certain machine and sold it to B making a profit of 5 per cent. B re-sold the machine for £19 19s. thereby losing 5 per cent. on his transaction. Find how much A paid for the machine.

[20 marks.]

[P.T.O.]

2. The diagonal of a square is x cms. in length; show that the length of the side of the square is $\frac{\sqrt{2}}{2} x$ cms.

The diagonal of a bar of square section is 4 cms. and the length of the bar is 1 metre: find its weight if the metal weighs 7.25 gms. per c.c.

[10 marks.]

3. Draw a graph for finding the number of gallons in a given number of cubic feet, given that 8 cubic feet is equivalent to 50 gallons.

Use the graph to find (i) the number of gallons in 6.4 cu. ft., (ii) the number of cu. ft. in 18 gallons.

[10 marks.]

4. (a) Using the book of tables supplied, write down the value of each of the following:—

$\log 101.3$; $\log 0.0137$; $\text{antilog } 1.3004$;
 $\text{antilog } \bar{3}.6419$.

(b) If $\log 2 = x$ and $\log 3 = y$, write down the logs of 6, 8 and 12 in terms of x and y .

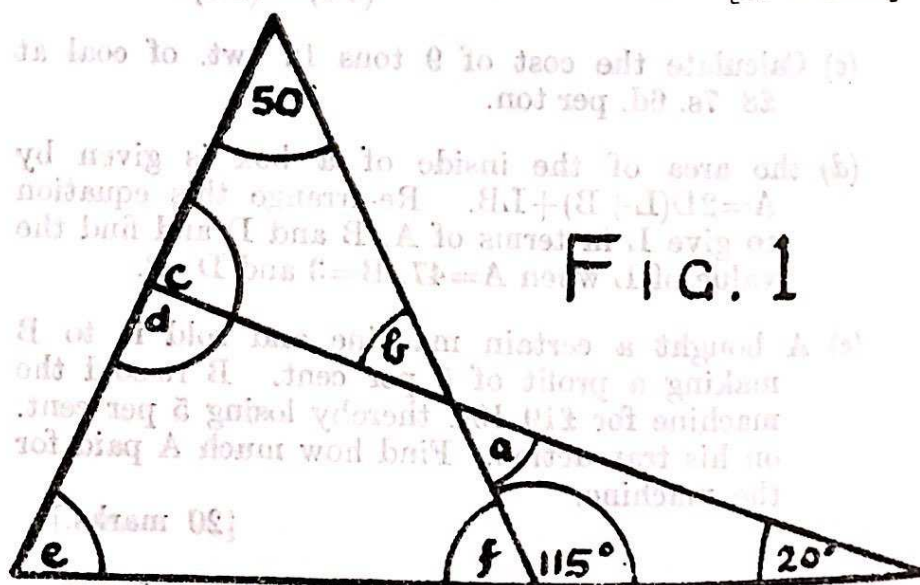
(c) Evaluate using logs: $\sqrt{\frac{124.1 \times 0.193}{12.7 \times 0.06}}$.

[12 marks.]

5. (a) Prove that the exterior angle of any triangle is equal to the sum of the opposite interior angles.

(b) Calculate the value of the angles marked a , b , c , d , e and f as shown in Fig. 1.

[12 marks.]



6. Solve the equations :—

(a) $\frac{x+1}{0.2} - \frac{x-2.5}{0.5} = 16.$

(b)
$$\begin{cases} \frac{x}{2} - \frac{y}{3} = 0 \\ \frac{x}{4} + \frac{y}{5} = 2\frac{1}{5} \end{cases}$$

(c) $2x^2 - x = 25x.$

[12 marks.]

7. Farmer A has equipment which can plough 14 acres in 8 hours and farmer B has a different type of equipment which can plough 10 acres in the same time. Farmer A starts ploughing a 10 acre field and after working for 2 hours gets B to help him.

What further time will it take the two men working together to finish the job ?

[14 marks.]

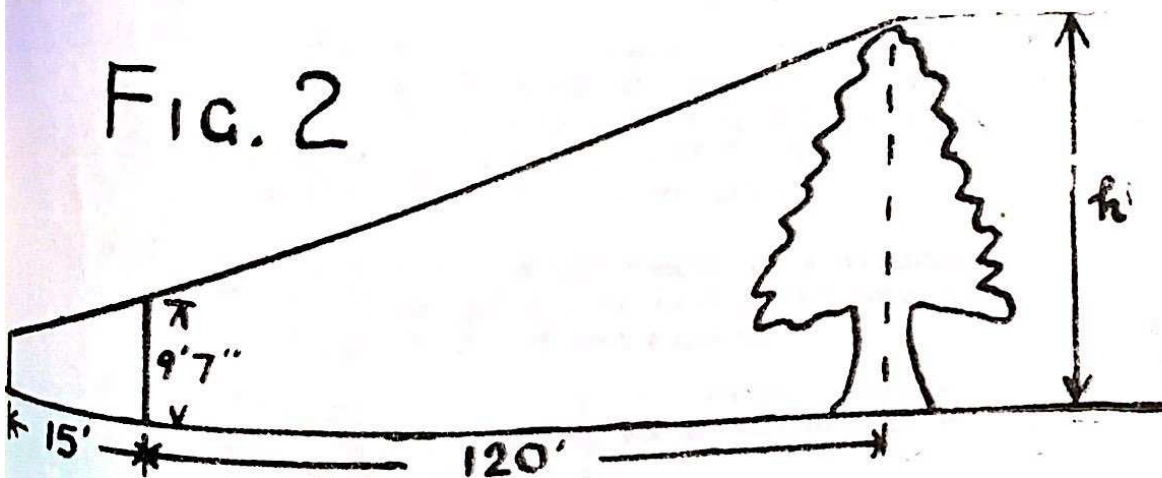
8. Draw on squared paper a triangle whose vertices are at the points (0, 1), (3, 6), (8, 2). Find its area by any *two* methods and find also the co-ordinates of the mid-point of the median from the vertex (3, 6) to the opposite side.

[14 marks.]

9. (a) Using instruments, construct accurately an angle whose tangent is $\frac{1}{2}$ and find *by calculation* the value of its sine and cosine. ($\sqrt{5} = 2.236$).

(b) The top of a tree is sighted along the tops of two posts as shown in Fig. 2. From the data given, find the height of the tree to the nearest foot.

[14 marks.]



[P.T.O.]

10. The following table gives corresponding measurements of two quantities x and y , which were obtained in an experiment :—

x	8.3	9.4	10.6	12.1	13.8	15.0
y	96.0	108.5	122.0	138.5	157.8	171

Plot a graph to show the relationship between y and x and find (a) the value of y when $x=8.7$ and (b) the law of the graph in the form $y=mx+c$.

[14 marks.]

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[14 marks.]

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[14 marks.]



[14 marks.]