

AN ROINN OIDEACHAIS.

(Department of Education).

INTERMEDIATE CERTIFICATE EXAMINATION, 1956.

MATHEMATICS (Algebra).

MONDAY, 11th JUNE.—MORNING, 10 TO 12.30.

All questions to be answered.

Mathematical Tables may be obtained from the Superintendent.

1. (i) Solve the equation $\frac{1}{3}(2x-1) - \frac{1}{2}(x-3) = 2$.
(ii) When you add 5 to a certain number and then divide the sum by 3 you get the same result as you do when you subtract 10 from the number and then multiply the remainder by 2: find the number.

[28 marks.]

2. (i) If l , b , h are the length, breadth, and height of a room, respectively, and A the area of the four walls, express A in terms of l , b , h .

- (ii) Given that $y = \frac{x-1}{x+1}$, express x in terms of y .

- (iii) If $2xz - 2x + z - 3 = 0$ and $yz - y + 4z - 5 = 0$, express z in terms of x and express z in terms of y , and hence express y in terms of x .

[28 marks.]

3. A man played a certain number of games of cards. He got 3s. for every game he won and paid out 1s. for every game he lost; at the end he had lost 8s. If he had got 2s. for every game he won and had paid out 6d. for every game he lost, he would have lost only 2s. How many games did he win and how many games did he lose?

[28 marks.]

4. Factorise fully:

(i) $5x^2 - 9x - 2$;

(ii) $x^2 + xz - y^2 + yz$;

(iii) $x^3 + 2x^2 - 5x - 6$;

(iv) $a^2 - 5a(b+1) - 6(b+1)^2$.

[28 marks.]

5. From the formula $h=80t-16t^2$ find

(i) the values of t for which $h=36$,

(ii) the values of t , correct to one decimal place, for which $h=40$.

[28 marks.]

6. (i) Simplify $\frac{2-\sqrt{3}}{\sqrt{3}-1}$ by rationalising the denominator.

Hence, or otherwise, find the square root of $4-2\sqrt{3}$ in simplest surd form.

(ii) If $2^x=10$, find the value of x correct to one decimal place.

[30 marks.]

7. A lidless rectangular box with a square base is to be made of tin. The box is to have a volume of 3 cub. ft. If x ft. is the width of the base, and if A sq. ft. is the area of tin required to make the box, show that $A=x^2+\frac{12}{x}$.

Draw the graph of $x^2+\frac{12}{x}$ for values of x from $x=\frac{1}{2}$ to $x=5$.

Find from your graph, as accurately as you can,

(i) the values of x for which $A=15$;

(ii) the least area of tin required to make the box, and the corresponding value of x .

[30 marks.]