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(Department of Education).

INTERMEDIATE CERTIFICATE EXAMINATION, 1952.

MATHEMATICS (Algebra).

TUESDAY, 17th JUNE.—Morning, 10 to 12.30.

The total number of questions answered should not exceed *six*.

Mathematical Tables may be obtained from the Superintendent.

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1. (i) Solve the simultaneous equations

$$\left. \begin{array}{l} 2x+3y= 1 \\ 5x-2y=12 \end{array} \right\}$$

(ii) Find, correct to two places of decimals, the values of x which satisfy the equation $x^2+4x-1=0$.

[30 marks.]

2. A man is travelling at the rate of x miles per hour.

(a) How far will he travel in y hours ?

(b) How long will it take him to travel z miles ?

(c) If he were to travel p miles per hour faster, how many hours would he save on a journey of q miles ?

[30 marks.]

3. The length of a rectangular plot of ground is twice its breadth. If 2 yards were added to its length and 5 yards added to its breadth, its area would be 330 square yards. Find the dimensions of the plot.

[30 marks.]

4. Factorise :

(i) $ab+cd-bc-ad$.

(ii) a^3-8b^3.

If x^3+px^2-5x+6 is exactly divisible by $x+2$, find the value of p, and factorise the expression fully.

[35 marks.]

5. Solve the equation $\sqrt{2x+8}-2\sqrt{x+5}+2=0$, and test your solutions.

[35 marks.]

Or,

5. (i) Prove that $\log_{10}a^x=x\,\log_{10}a$.

(ii) Solve the equation $6^{x-1}+6^{x-3}=3417$, giving the answer correct to one decimal place.

[35 marks.]

6. Draw the graph of $2x^2+x-5$ for values of x from $x=-3$ to $x=+2$.

Find from your graph, as accurately as you can, the roots of the equations (i) $2x^2+x=5$, (ii) $2x^2+x=9$.

[35 marks.]

7. P and Q are two stations 60 miles apart. A train, A, leaves P for Q and at the same time another train, B, leaves Q for P ; and B travels 7 miles per hour faster than A. The two trains pass each other at 12 o'clock, and A reaches Q at 2.0 p.m. Find the speeds of the trains.

[35 marks.]