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(Department of Education).

INTERMEDIATE CERTIFICATE EXAMINATION, 1954.

MATHEMATICS (Algebra).

TUESDAY, 15th JUNE.—MORNING, 10 TO 12.30.

All questions to be answered.

Mathematical Tables may be obtained from the Superintendent.

1. (i) Solve the equation $3(x-1) - \frac{1}{2}(x-5) = 4 + \frac{2}{5}x$.

(ii) Solve the simultaneous equations

$$\left. \begin{array}{l} 3x - 4 = 2y + 9 \\ 5x - 11 = 3y + 10 \end{array} \right\}$$

[28 marks.]

2. Six years ago A was five times as old as B was, and four years from now A will be two and one-half times as old as B will be. Find the present ages of A and B.

Find also when the sum of their ages will equal sixty years.

[28 marks.]

3. (a) Express the fraction $\frac{3x^2 + 10x - 8}{2x^2 + 7x - 4}$ in simplest form, and

find its value when $x = 1\frac{1}{5}$.

(b) Factorise fully

(i) $x^3 + 2x^2y - xy^2 - 2y^3$;

(ii) $2x^3 + x^2 - 13x + 6$.

[28 marks.]

4. Solve the following equations, giving your solutions correct to two decimal places :—

(i) $2x^2 - 8x + 3 = 0$;

(ii) $2(3x-1)^2 - 8(3x-1) + 3 = 0$.

[28 marks.]

5. A man spent 15 shillings on meat. Had the meat been 4 pence per pound dearer he would have obtained one and a half pounds less for the 15 shillings. Find the price of the meat per pound. [28 marks.]

6. If $p = \log_{10} 2$ and $q = \log_{10} 3$, express the following in terms of p and q : (i) $\log_{10} 6$; (ii) $\log_{10} 6\frac{2}{3}$; (iii) $\log_5 7\frac{1}{2}$.

Show also, without using the Tables, that $4q$ is greater than $(3p+1)$. [30 marks.]

7. Draw the graph of $2x^2 - 6x + 3$ for values of x from $x = -1$ to $x = 4$.

Find from your graph, as accurately as you can, the roots of the equations (i) $2x^2 - 6x + 3 = 0$, (ii) $2x^2 - 6x = 1$. [30 marks.]