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INTERMEDIATE CERTIFICATE EXAMINATION, 1942.

ELEMENTARY MATHEMATICS (Algebra).
FOR GIRLS ONLY.

MONDAY, 15th JUNE.—AFTERNOON, 3 TO 4.30.

Six questions may be answered.

All questions carry equal marks.

Mathematical Tables may be obtained from the Superintendent.

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1. Divide the expression $6x^3-19x^2+20x-18$ by $3x^2-5x+7$. For what value of x would the remainder be equal to zero?

2. Express each of the following statements by an algebraic equation :—

    (i) "If 5 be subtracted from six times a certain number the remainder is equal to 12 increased by that number."

    (ii) "The square of the sum of two numbers is equal to the square of their difference added to four times their product."

    (iii) "Three times the square root of a certain number exceeds twice its cube root by 4."

3. x tons of coal cost $£y$: find

    (i) the cost of z tons;

    (ii) how many tons could be purchased for $£p$;

    (iii) what profit would be made by selling the x tons at $£5$ per ton.

4. Find, in simplest form, the factors of :—

    (i) $6x^2-5x-6$;

    (ii) $(7x-3y+5)^2-(4x+3y-4)^2$;

    (iii) $9bc-4ad+6ac-6bd$.

5. For what values of t is

$$\frac{t+1}{t-1} - \frac{3(t-1)}{t+1}$$

equal to 2 ?

6. Write down three consecutive numbers of which x is the middle number.

Find three consecutive numbers such that the sum of their squares is equal to 365.

7. The daily wage for 6 men and 5 boys was £5 18s. and the daily wages for 8 men and 3 boys was £6 19s. Find the wage of one man and the wage of one boy.

8. Find, to *two* places of decimals, the roots of the equation

$$x^2 = 5(x+4).$$

9. Prove the following identities :—

   (i) $(x-y)^2 + (y-z)^2 + (z-x)^2 + (x+y+z)^2 \equiv 3(x^2 + y^2 + z^2)$;

   (ii) $a^2 + b^2 + c^2 - ab - bc - ca \equiv \frac{1}{2}[(a-b)^2 + (b-c)^2 + (c-a)^2]$.

10. Evaluate $x^2 - x$ for the following values of x :

$$-3, -2, -1, 0, 1, 2, 3.$$

Using those values draw the graph of $x^2 - x$ from $x = -3$ to $x = 3$.

From your graph find approximately :—

   (i) the value of $x^2 - x$ when $x = 1 \cdot 7$,

   (ii) the values of x when $x^2 - x = 5$.