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INTERMEDIATE CERTIFICATE EXAMINATION, 1940

ELEMENTARY MATHEMATICS (Algebra).

FOR GIRLS ONLY.

TUESDAY, 18*th JUNE*.—AFTERNOON, 3 P.M. TO 4.30 P.M.

Six questions may be answered.

All questions carry equal marks.

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1. Solve the equations

$$x-y=4,$$
$$6x+y=-11.$$

2. Find the value of x which satisfies the equation

$$\tfrac{2}{3}x-\tfrac{3}{4}(3-2x)=1.$$

Verify your answer.

3. Factorise

(*a*) $ab-2bc-3ad+6cd$;

(*b*) $a^2-2ac+c^2-b^2$;

(*c*) $(2x+y)(2x-y)+2y-1$.

4. Find, correct to two decimal places, the values of x which satisfy the equation

$$(2x-9)^2=7$$

5. Simplify

(*a*) $\dfrac{(a+b-c)^2-(a-b+c)^2}{b-c}$;

(*b*) $\dfrac{x+2}{x^2+4x-5} - \dfrac{x+3}{x^2+6x+5}$.

6. A telegram costs a shilling for the first 9 words plus a penny for every word over 9. What is the charge for a telegram containing (i) 20 words, (ii) n words (where $n>9$)?

How many words can you get for (*a*) 3 shillings, (*b*) x shillings (when $x>1$)?

7. A motorist takes 3 hours to cover 108 miles. Over part of the journey he drives at 40 miles per hour and over the rest at 30 miles per hour. Find the length of each part.

8. A householder uses x units of electricity and he may pay for it at the rate of 4 pence per unit *or* he may pay $\frac{3}{4}$d. per unit in addition to a fixed charge of 9s. 9d. Find the value of x for which the cost by either of these methods of payment is the same. How many units will cost 1s. 1d. more by one method than the other?

[A graphical solution will be accepted.]

9. Find the values of x^2-2x when $x=-1, -\frac{1}{2}, 0, \frac{1}{2}, 1, 1\frac{1}{2}, 2, 2\frac{1}{2}, 3$.

Use these values to draw the graph of x^2-2x and find from the graph the values of x for which $x^2-2x=1$.