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(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS
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INTERMEDIATE CERTIFICATE EXAMINATION, 1939.

ELEMENTARY MATHEMATICS (Algebra).
FOR GIRLS ONLY.

MONDAY, 19th JUNE.—AFTERNOON, 3.30 P.M. TO 6 P.M.

Seven questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

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1. Solve the equations :

   (i) $\dfrac{x-a}{b} + \dfrac{x-b}{a} = 2$;

   (ii) $\dfrac{x-13}{17} + \dfrac{x-17}{13} = 2.$

   [20 marks.]

2. Factorise :

   (i) $a(a+c) - b(b+c)$;

   (ii) $(ax+by)^2 + (bx-ay)^2$;

   (iii) $(x^2 - 6x - 3)^2 - (x-3)^2.$

   [20 marks.]

3. If it takes a girl 10 minutes longer to walk to school at 3 miles per hour than to walk home again from school at 4 miles per hour, how far is the school from her home ?

   [20 marks.]

4. Simplify :

   (i) $\dfrac{2}{3}(2x-y) - \dfrac{3}{4}(x-3y) + \dfrac{5}{12}(x+y)$;

   (ii) $\dfrac{a^6 - 1}{(a^2+a+1)(a^2-a+1)}$.

   [20 marks.]

5. If a shopkeeper sold a hat for 10 shillings he would gain as many shillings as he would lose pence if he sold it for 1s. 4d. What did the hat cost him ?

[22 marks.]

6. If the sides of a triangle are $2x+1$, $2x^2+2x$, $2x^2+2x+1$ respectively, prove that the triangle is right-angled.

If the hypotenuse is 85, what are the other sides ?

[22 marks.]

7. A polygon with n sides has $\frac{1}{2}n(n-3)$ diagonals. How many diagonals has a polygon of 8 sides ? How many sides has a polygon with 27 diagonals ? How many sides has a polygon which has twice as many diagonals as sides ?

[22 marks.]

8. Express $9x^2-30x+24$ as the difference of two squares.

Solve the equation $3x-5=\dfrac{1}{3x-5}$.

[22 marks.]

9. In the formula $F=32+\dfrac{9}{5}C$, F and C represent temperature in degrees Fahrenheit and Centigrade respectively. Draw a graph to show the number of degrees Fahrenheit which correspond to temperatures from 0° to 100° Centigrade. Read from your graph the number of degrees Fahrenheit in 55° Centigrade and the number of degrees Centigrade in 112° Fahrenheit.

[22 marks.]