AN ROINN OIDEACHAIS.

(Department of Education.)

BRAINNSE AN MHEADHON-OIDEACHAIS
(Secondary Education Branch).

INTERMEDIATE CERTIFICATE EXAMINATION, 1939.

ELEMENTARY MATHEMATICS (Geometry).
FOR GIRLS ONLY.

THURSDAY, 15th JUNE.—Morning, 10 a.m. to 12.30 p.m.

Six questions may be answered.

All questions carry equal marks.

Mathematical Tables may be obtained from the Superintendent.

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1. ABC is a triangle in which AB is greater than AC : prove that the angle ACB is greater than the angle ABC.

2. The side AB of a triangle ABC is 3·25 inches long and the angles ABC and ACB are 32° and 76° respectively. Construct the triangle as accurately as you can. Construct also a rectangle equal in area to the triangle ABC.

3. State and illustrate by diagrams the geometrical theorems which correspond to the identities

    (i) $(a+b)^2 = a(a+b) + b(a+b)$;

    (ii) $(a-b)^2 = a^2 - 2ab + b^2$.

4. What is the locus of a point which is equidistant from (i) two given points, (ii) two given straight lines ?

Draw a triangle ABC and explain how you would find the centre of the circle (*a*) which passes through the vertices, (*b*) which touches the sides.

[No proof required.]

5. If at the extremity of a chord of a circle a tangent is drawn, prove that the angles it makes with the chord are equal to the angles in the alternate segments.

6. If the bisectors of two angles of a quadrilateral are parallel, prove that the other two angles are equal.

7. Prove that the square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the other two sides.

8. Two equal chords AB, CD of a circle intersect. Prove that one pair of sides of the figure ACBD are equal and that the other pair are parallel.

9. Two rectangles are formed, one by the internal and the other by the external bisectors of the angles of a parallelogram. Prove that the area of the parallelogram is equal to half the difference between the areas of the rectangles.