

**AN ROINN OIDEACHAIS**  
(Department of Education).

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**INTERMEDIATE CERTIFICATE EXAMINATION, 1954.**

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**ELEMENTARY MATHEMATICS (Geometry).**  
**FOR GIRLS ONLY.**

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*FRIDAY, 11th JUNE.—MORNING, 10 TO 12.*

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All questions carry equal marks.

All questions to be answered.

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1. Prove that the opposite sides of a parallelogram are equal and that the diagonals bisect each other.

2. Prove that equal chords in a circle are equidistant from the centre.

What is the locus of the centres of equal chords in a circle ?

3. In a triangle ABC the sides AB and AC are equal: prove that the angles ABC and ACB are equal.

If E, F are the middle points of AB, AC respectively, prove that  $BF=CE$ .

4. Using ruler and compass only, construct a triangle ABC such that  $AB=5''$ , the angle  $ACB=90^\circ$  and the angle  $BAC=30^\circ$  and inscribe a circle in the triangle. (No proof is required but lines of construction should be clearly shown.)

5. Prove that the angles made by a tangent to a circle with a chord drawn from the point of contact are respectively equal to the angles in the alternate segments of the circle.

6. Prove that the area of a triangle is equal to half the area of the rectangle on the same base and having the same altitude.

The diagonals AC, BD of the quadrilateral ABCD intersect at E. If the triangles ABC and ADC are equal in area, prove that  $BE=ED$ .