

AN ROINN OIDEACHAIS

(Department of Education)

INTERMEDIATE CERTIFICATE EXAMINATION, 1959.

ELEMENTARY MATHEMATICS (Geometry). FOR GIRLS ONLY.

THURSDAY, 4th JUNE.—MORNING, 10 TO 12.

All questions to be answered.

All questions carry equal marks.

1. Using ruler and compass only, construct

(a) a square of side 3 inches,

(b) a square of diagonal 4 inches.

All construction lines must be shown clearly.

2. Two straight lines AB and CD cut each other at E. Prove that the angle AEC is equal to the angle BED.

If EM bisects the angle AEC and EN bisects the angle BED, prove that EM and EN are in the same straight line.

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

Through a point P inside a circle, the centre of which is O, two equal chords are drawn. Prove that OP bisects the angle between the chords.

4. Using ruler and compass only, construct a triangle ABC such that BC is 3 inches long and each of the angles $\hat{A}CB$ and \hat{ABC} is 30° .

Then, construct on AC an isosceles triangle equal in area to the triangle ABC.

[No proof is required but all construction lines must be shown clearly.]

5. Show, with proof, how to circumscribe a circle about a given triangle.

If a triangle contains an obtuse angle, prove that the centre of its circumscribed circle is outside the triangle.

6. In a quadrilateral inscribed in a circle, prove that the opposite angles are together equal to two right angles.

In a quadrilateral ABCD which is inscribed in a circle, AD is parallel to BC. Prove that $AC=BD$.