

# AN ROINN OIDEACHAIS

(Department of Education).

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INTERMEDIATE CERTIFICATE EXAMINATION, 1950.

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

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WEDNESDAY, 7th JUNE.—MORNING, 10 TO 12.

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*Six* questions may be answered.

All questions carry equal marks.

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1. If one side of a triangle is greater than another, prove that the angle opposite the greater side is greater than the angle opposite the lesser.

2. Prove that triangles on the same base and between the same parallels are equal in area.

The base BC of a triangle ABC is bisected at X, and Y is any point on the line AX; show that the triangles ABY, ACY are equal in area.

*Or*

2. Show how to describe an isosceles triangle equal in area to a given triangle and standing on the same base. Give proof.

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

4. What is a cyclic quadrilateral?

Prove that the opposite angles of a cyclic quadrilateral are together equal to two right angles.

*Or*

4. If a straight line touches a circle, and if from the point of contact a chord is drawn, prove that the angles which the chord makes with the tangent are respectively equal to the angles in the alternate segments.

[P.T.O.]

5. Prove that the bisectors of the angles of a triangle are concurrent. State briefly, without proof, how you would inscribe a circle in a given triangle.

*Or,*

5. Using ruler and compass only, draw a circle of radius one inch and circumscribe about the circle a triangle with angles equal to  $90^\circ$ ,  $45^\circ$ ,  $45^\circ$ , respectively.

[No proof is required but a short explanation of your construction should be given.]

6. Construct, as accurately as you can, a cyclic quadrilateral ABCD such that  $AB=4$ ,  $BC=3$ ,  $CD=2$  and  $\angle ABC=60^\circ$ .

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