

# AN ROINN OIDEACHAIS

(Department of Education.)

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INTERMEDIATE CERTIFICATE EXAMINATION, 1943.

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## ELEMENTARY MATHEMATICS (Geometry).

### FOR GIRLS ONLY.

TUESDAY, 8th JUNE.—AFTERNOON, 3 TO 4.30.

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*Six* questions may be answered.

All questions carry equal marks.

Mathematical Tables may be obtained from the Superintendent.

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1. Prove that the sum of the angles of a triangle is equal to two right angles.

What is the sum of the angles of a five-sided figure ?

2. AB is the diameter of a semi-circle ACB : prove that the angle ACB is a right-angle.

If Q is any point inside the semi-circle, prove that the angle AQB is greater than a right-angle.

3. ABCD is a rhombus : prove that its diagonals AC, BD bisect each other at right angles.

Construct accurately a rhombus whose diagonals shall be 5 inches and 3 inches, respectively, in length.

4. Show geometrically how to divide a given straight line into three equal parts. Give proof.

5. Prove that the angle subtended by an arc of a circle at the centre is double the angle subtended by it at the circumference.

6. Show how to inscribe a circle in a triangle whose sides are 2 inches,  $2\frac{1}{2}$  inches, 3 inches, respectively, in length.

Give proof, and measure the length of the radius of the circle.

7. Prove that parallelograms on the same base and between the same two parallel lines are equal in area.

8.  $AB$ ,  $CD$  are two parallel lines. What is the locus of the centres of circles which touch both  $AB$  and  $CD$ ?

$P$  is any point between  $AB$  and  $CD$ . Show how to construct a circle which shall pass through  $P$  and touch both  $AB$  and  $CD$ .

9. Using squared-paper, protractor and a large diagram, drawn to scale, solve the following:

From a point  $A$  on level ground a man saw two rocks,  $R_1$ ,  $R_2$  in a line due east of  $A$ . On walking 4 miles due north to a point  $B$  he found that the angle  $ABR_1 = 40^\circ$  and that the angle  $ABR_2 = 70^\circ$ . Find the distance between  $R_1$  and  $R_2$ .