

AN ROINN OIDEACHAIS  
(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS  
(Secondary Education Branch).

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INTERMEDIATE CERTIFICATE EXAMINATION, 1933.

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ELEMENTARY MATHEMATICS (Geometry).  
FOR GIRLS ONLY.

FRIDAY, 16th JUNE.—MORNING, 10 A.M. TO 12.30 P.M.

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Six questions may be answered.

All questions carry equal marks.

Mathematical Tables may be obtained from the Superintendent.

1. Draw a triangle with sides 2,  $2\frac{1}{2}$ , 3 inches long respectively and construct the circumcircle of the triangle.

(No proof is required but the construction lines should be clearly shown.)

2. Prove that the angle in a semicircle is a right angle.

P is any point inside a circle and AB is any diameter: prove that the angle APB is greater than a right angle.

3. Prove that the sum of the angles of a triangle is two right angles.

Find the number of degrees in an angle of a regular polygon of 10 sides.

4. Draw a rectangle seven sq. inches in area and construct a square equal to it in area.

5. Prove that the straight line joining the middle points of two sides of a triangle is parallel to the third side.

6. Illustrate by diagrams the identities:—

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

(ii)  $(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$ .

7. AD is the perpendicular from A to the base BC of a triangle ABC. Prove that  $BD^2 - DC^2 = AB^2 - AC^2$ .

If  $AB = 7''$ ,  $AC = 5''$ , and  $BC = 8''$ , find the length of BD.

8. A person travels 20 miles West and then 30 miles North-West. He then proceeds directly to a place which is 40 miles North of his starting point.

Illustrate this journey by means of a scale drawing. Find the total length of the journey and the shortest distance he was away from the starting point during the last stage of the journey.

9. Find the locus of a point equidistant from two given points.

$ABCD$  is a quadrilateral in which  $AB=CD$ . Find a point  $P$  so that the triangles  $APB$ ,  $CPD$  may be congruent.