

## AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1962.

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

FRIDAY, 8th JUNE.—Morning, 10 to 12.

All questions to be answered.

All questions carry equal marks.

1. If two sides of a triangle are equal, prove that the angles opposite those sides are equal.

ABC is a triangle in which  $AB = AC$ , and P is a point on AB such that  $CP = CB$ . Prove that  $\angle BPC = \angle BCA$ .

2. Prove that if two sides of a quadrilateral are equal and parallel, then the other two sides are also equal and parallel.

3. What is the locus of a point P such that P is equidistant from two fixed points A, B? (Proof not required.)

Prove that the straight lines which bisect the sides of a triangle at right angles are concurrent.

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

ABCD is a quadrilateral in which AB and DC are parallel. AC and BD intersect at O. Prove that the triangles AOD, BOC are equal in area.

5. Prove that an angle at the centre of a circle is double an angle at the circumference standing on the same arc.

O is the centre of a circle and A, B, C, D are four points in that order on the circumference. If  $\angle AOC = 100^\circ$ , how many degrees are there in the angles ABC and ADC?

6. Prove that the two tangents drawn to a circle from an external point are equal.

The inscribed circle of a triangle ABC touches BC at D. Prove that  $AB + BC - CA = 2BD$ .