AN ROINN OIDEACHAIS

(Department of Education).

INTERMEDIATE CERTIFICATE EXAMINATION, 1948.

ELEMENTARY MATHEMATICS (Geometry).
FOR GIRLS ONLY.

WEDNESDAY, 16th JUNE.—MORNING, 10 TO 12.

Six questions may be answered.

All questions carry equal marks.

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1. What are "parallel straight lines"?

Prove that the diagonals of a parallelogram bisect each other.

2. Construct a parallelogram of area 10 square inches such that one side may be 5 inches long and one angle 30°. Explain your method. [Use ruler and compass only.]

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

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

Or

If two circles touch one another externally, prove that the straight line which joins their centres passes through the point of contact.

5. Prove that the angles in the same segment of a circle are equal.

ABC is a triangle in which AB=BC. P is a point in AC. BP produced meets the circumference of the circumcircle of the triangle at R. Prove that $\angle BPA = \angle BAR$.

P.T.O.

6. Show how to inscribe in a given circle a triangle equiangular to a given triangle. Give proof.

7. ABC is an equilateral triangle of side 8 centimetres. Construct the locus of a point which is 3 centimetres distant from the side AC. Hence find by construction the position of a point P in AB which is 3 centimetres nearer to BC than to AC.

8. In a circle a chord QR produced meets a diameter AB produced at P. If $\angle QAR=50°$ and $\angle QPA=30°$, find the size of the angle QRA.

[Hint: Let $\angle QRA=x°$ and $\angle RAB=y°$.]