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INTERMEDIATE CERTIFICATE EXAMINATION, 1965

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## ELEMENTARY MATHEMATICS (GEOMETRY)

For girls only

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MONDAY, 21st JUNE.—Morning, 10 to 12

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All questions to be answered.All questions carry equal marks.

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

2. If two sides of a triangle are equal, prove that the angles opposite these sides are also equal.

ABC is a triangle in which  $AB = AC$ . If P is a point inside the triangle such that  $\angle CBP = \angle BCP$ , prove that PA bisects  $\angle BAC$ .

3. Using ruler and compass only, construct a triangle ABC so that the base  $BC = 4''$ ,  $\angle ABC = 30^\circ$ ,  $\angle ACB = 45^\circ$ .

Construct, also, the circle that passes through the points A, B, C.

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

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

A, B, C, D are four points in that order on the circumference of a circle such that AB and DC are parallel. If AC cuts BD at P, prove that  $\angle BPC = 2\angle BDC$ .

5. Prove that the angles made by a tangent to a circle with a chord drawn from the point of contact are respectively equal to the angles in the alternate segments of the circle.

A triangle ABC is inscribed in a circle. If the bisector of the angle ABC meets AC at D and if the tangent at B meets CA produced at T, prove that  $TB = TD$ .

6. 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.