INTERMEDIATE CERTIFICATE EXAMINATION, 1966

ELEMENTARY MATHEMATICS (GEOMETRY)

FOR GIRLS ONLY

MONDAY, 13th JUNE - Morning, 10 to 12

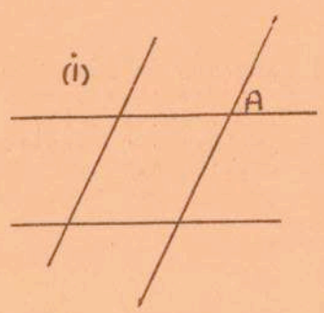
All questions to be answered.

All questions carry equal marks.

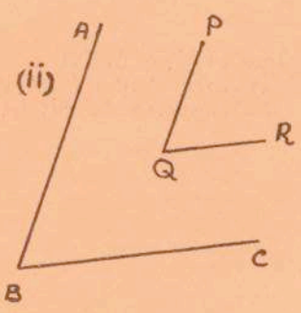
1. Prove that the sum of the angles of a triangle is equal to two right angles.
Prove that the sum of the angles of a quadrilateral is equal to four right angles.

2. Using ruler and compass only
(i) construct a triangle ABC such that $\angle ABC = 60°$, AB = 2", BC = 4", and
(ii) find the point on BC which is nearest to A.
[No proof of (i) or (ii) is required but lines of construction should be clearly shown].

3. (i) Draw two intersecting pairs of parallel lines and mark one of the angles with an A, as in diagram (i). Then mark with an X all the angles in your diagram which are equal to the angle A.



(ii) Prove that the angle PQR is equal to the angle ABC if PQ is parallel to AB and QR is parallel to BC, as in diagram (ii).



4. Prove that parallelograms on the same base and between the same parallels are equal in area.
Given a square of area 4 sq. in. show how to construct a parallelogram having the same base and area as the square, and so that the perimeter (sum of the sides) of the parallelogram will be 12 in. (No proof is required).

5. What is the locus of points which are equidistant from two fixed points P and Q ?
Show how to circumscribe a circle about a given triangle, and give proof.

6. Show how to draw a tangent to a circle from a given point outside it, and give proof.
P is a point outside a circle of centre O and radius 5 inches. If OP = 13 inches, calculate the length of the tangent from P to the circle.