

COMMON EXAMINATION FOR
ENTRANCE TO PUBLIC SCHOOLS AND
ROYAL NAVAL COLLEGE, DARTMOUTH.

SUBJECT—GEOMETRY.

[75 minutes.]

[N.B.—All boys MUST do A before going on to B, but are recommended to do as much of B as they can. DO NOT REPRODUCE THE FIGURES UNLESS you think it necessary. All lines used in the constructions must be shown. In Questions I and IV, no description of the constructions used need be written, BUT THE FIGURES MUST SHOW CLEARLY THE METHODS OF CONSTRUCTION.]

A.

I. Draw a triangle ABC in which :—

$$BC = 3.6\text{in.}, \angle ABC = 40^\circ, \angle ACB = 64^\circ.$$

Measure AB.

Using the same figure, *construct* with ruler and compasses the line from A perpendicular to BC *without* using a set-square.

II. In Fig. 1, $BA = BC$, and BL is parallel to CM ;
 $\angle ABC = 40^\circ$, $\angle ACM = 30^\circ$.

Calculate $\angle BCA$, *giving your reasons fully*.

Prove that BA bisects $\angle LBC$.

III. Prove that the diagonals of a parallelogram bisect each other. You may assume any other facts about a parallelogram that you know.

IV. Draw a triangle ABC in which :—

$$AB = 2\text{in.}, BC = 2.4\text{in.}, CA = 2.8\text{in.}$$

Construct, using ruler and compasses only, the straight line through C parallel to AB.

V. In Fig. 2, OMA is the circle on OA as diameter and O is the centre of the larger circle. Any line through A cuts the smaller circle at M and cuts the larger circle at B. Prove that $AM = MB$. [The straight lines OM, OB, which have been inserted in the figure, may help you.]

B.

[Begin a new sheet.]

VI. Draw a line AB equal in length to PQ in Fig. 3. Use a *construction* to divide AB into five equal parts. *State the steps of your construction*. Indicate parallel lines by arrows as in Fig. 1.

[P. T. O.]

VII. In Fig. 4, DC is parallel to AB, and the area of $\triangle ABC$ is 20 sq. cm. ; $AB = 8$ cm., $CD = 6$ cm. Calculate the area of ABCD. Give your reasons fully.

VIII. In Fig. 5, PT is a tangent to the circle TQR, and PQR is a straight line.

(i) Name two angles in the figure which are equal to each other.

(ii) If $PQ = QT$, name two other lines in the figure which are of equal length.

Give reasons fully for each part of the question.

FIGURES FOR GEOMETRY PAPER.

N.B.—These figures are NOT accurately drawn and no measurements should be taken from them except those shown.

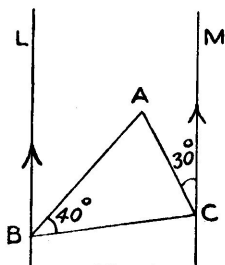


Fig. 1.

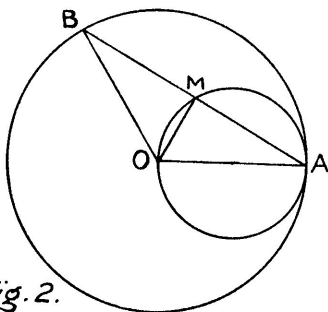


Fig. 2.

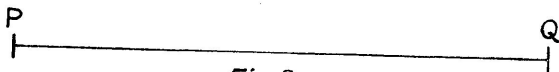


Fig. 3.

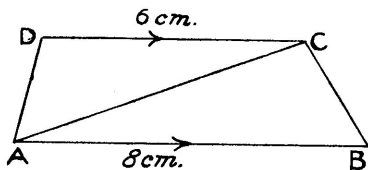


Fig. 4.

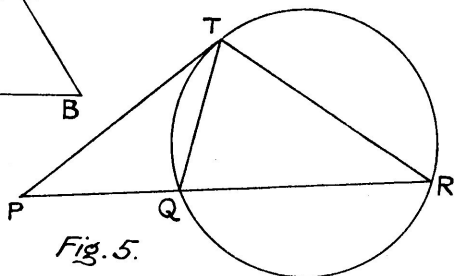


Fig. 5.