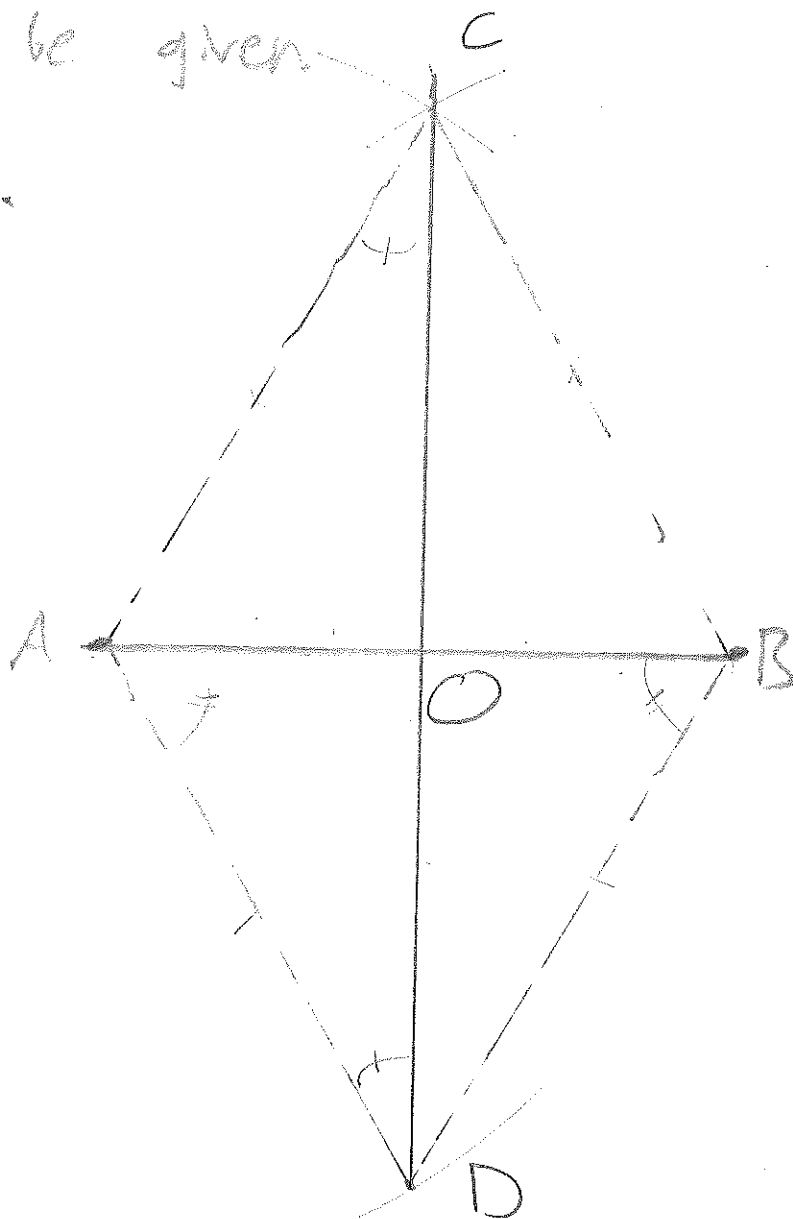


T. To construct the perpendicular bisector of a line.

Let  $AB$  be given.

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Paul Sintetos



Set compass to length of  $AB$ . Draw circles of that radius centered at  $A$  and  $B$ .

Label these points  $C$  and  $D$  as shown.

Join  $C$  and  $D$  to form the perpendicular bisector. Let the intersection of  $AB$  and  $CD$  be labeled  $O$ .

For the proof, see the reverse side of this page.

good on steps of construc.

By construction,  $AC$  is congruent to  $BC$ .

Likewise  $AD$  is congruent to  $BD$ .

Therefore  $\triangle ABD \cong \triangle ABC$ , and since  $AB \cong BC \cong AD \cong BD$ ,

$\triangle ACD \cong \triangle BCD$  by SSS.  $\checkmark$

By property of isosceles triangles,  $\angle DAO \cong \angle DBO$ ,

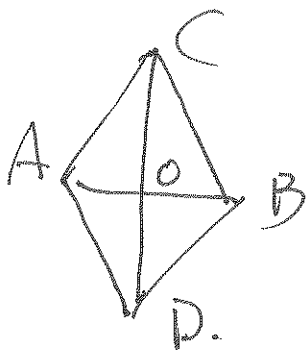
and  $\angle ADO \cong \angle BDO$ . Likewise,  $\angle CAO \cong \angle CBO$

and  $\angle BCO \cong \angle BDO$ . Therefore, by the ASA theorem

of Euclid,  $\triangle ADO \cong \triangle BDO \cong \triangle AOC \cong \triangle CBO$ .

Since corresponding parts of congruent triangles are congruent,  $|AO| = |BO|$ .  $\checkmark$

Define a perpendicular to be a line that intersects another to form two congruent interior angles. Therefore,  $CD$  is perpendicular to  $AB$ , since corresponding angles of congruent triangles are equal. Henceforth, angles formed by two perpendicular lines will be known as right angles.



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