

1.

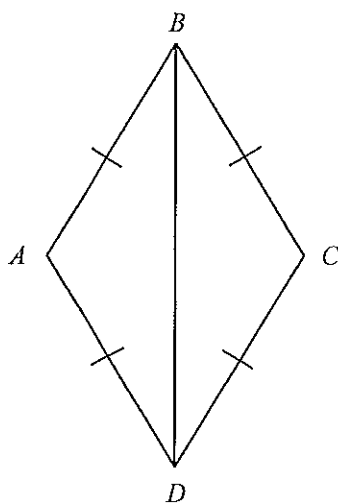


Diagram NOT accurately drawn

In the diagram, $AB = BC = CD = DA$.

Prove that triangle ADB is congruent to triangle CDB .

$AB = CD$ (given)
 $AD = BC$ (given)
 BD is common in both triangles.

SSS \therefore triangles are congruent

(Total 3 marks)

2.

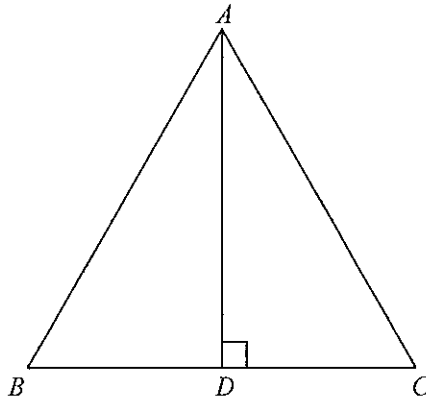


Diagram NOT accurately drawn

ABC is an equilateral triangle.

D lies on BC .

AD is perpendicular to BC .

(a) Prove that triangle ADC is congruent to triangle ADB .

AD is common in both triangles
 $\hat{A}DC = \hat{A}DB$ both 90° (perpendicular meets line at 90°)
 $AB = AC$ (sides in equilateral triangle are equal)

RHS \therefore triangles are congruent

(3)

(b) Hence, prove that $BD = \frac{1}{2}AB$.

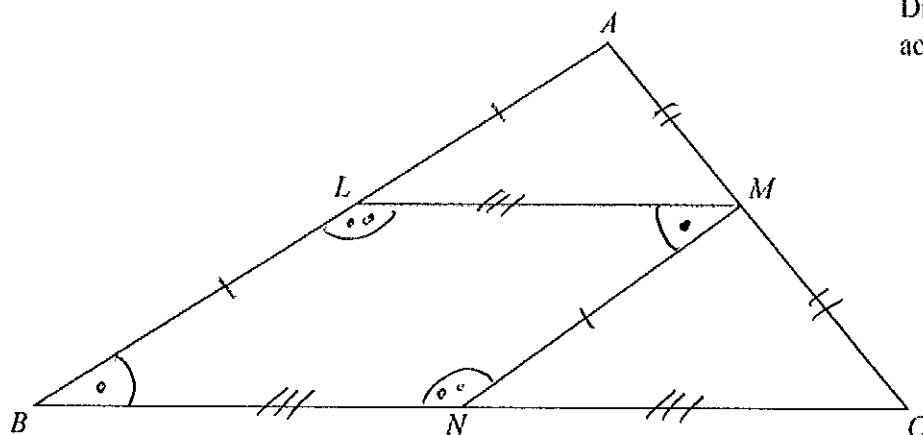
$BD + CD = BC$
As triangles are congruent $BD = CD = \frac{1}{2}BC$
 $BC = AB \therefore BD = \frac{1}{2}AB$

(2)

(Total 5 marks)

4.

Diagram NOT
accurately drawn



The diagram shows a triangle ABC .

$LMNB$ is a parallelogram where

L is the midpoint of AB ,

M is the midpoint of AC ,

and N is the midpoint of BC .

Prove that triangle ALM and triangle MNC are congruent.

You must give reasons for each stage of your proof.

$$BL = AL \quad (L \text{ is midpoint})$$

$$BL = MN \quad (\text{opposite sides in parallelogram})$$

$$\therefore \underline{AL = MN}$$

$$BN = CN \quad (N \text{ is midpoint})$$

$$BN = LM \quad (\text{opposite sides in parallelogram})$$

$$\therefore \underline{CN = LM}$$

$$\underline{AM = MC} \quad (M \text{ is midpoint})$$

$SSS \therefore$ triangles are congruent

(Total 3 marks)