1.

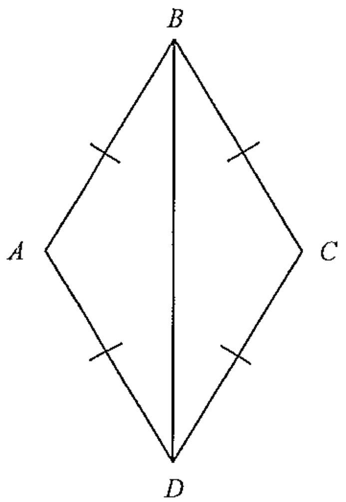

Diagram **NOT** accurately drawn

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 ∴ triangles are congruent

(Total 3 marks)

2.

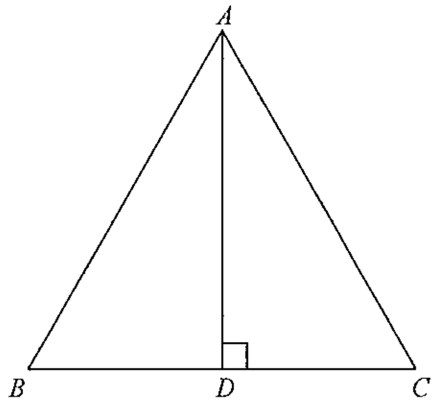

Diagram **NOT** accurately drawn

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
$A\hat{D}C = A\hat{D}B$ both 90° (perpendicular meets line at 90°)
AB = AC (sides in equilateral triangle are equal)

RHS ∴ triangles are congruent

(3)

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

BD + CD = BC
As triangles are congruent BD = CD = ½ BC
BC = AB ∴ $BD = \frac{1}{2}AB$

(2)
(Total 5 marks)

3.

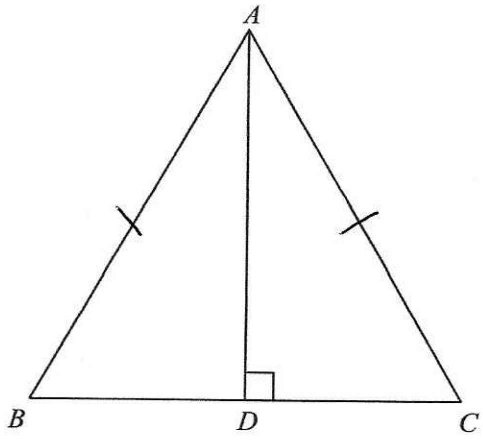

Diagram **NOT** accurately drawn

ABC is an equilateral triangle.
D lies on *BC*.
AD is perpendicular to *BC*.

Prove that triangle *ADC* is congruent to triangle *ADB*.

Length AB = AC Both sides of an equilateral triangle
(Hypotonuse)

Length AD is common to both triangles
(S)

ADC = ADB (Both 90° as AD is perpendicular to BC)
(R)

ADC is congruent to ADB RHS

(Total 3 marks)

4.

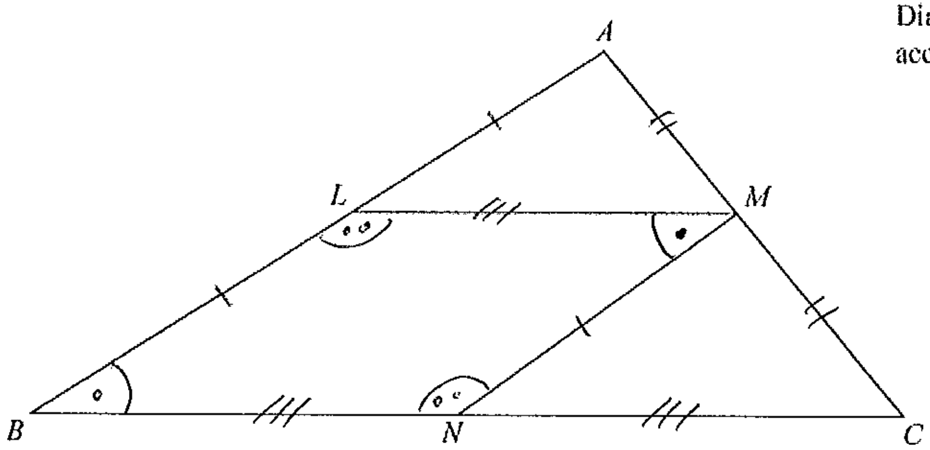

Diagram NOT accurately drawn

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 (L is midpoint)
BL = MN (opposite sides in parallelogram)
∴ AL = MN

BN = CN (N is midpoint)
BN = LM (opposite sides in parallelogram)
∴ CN = LM

AM = MC (M is midpoint)

SSS ∴ triangles are congruent

(Total 3 marks)