$AP = AQ$
To prove :
$BQ = CP$
Proof :
$AB = AC$ (given)
$AP = AQ$ (given)
$AB - AP = AC - AQ$
$=> BP = CQ$
$\angle ABC = \angle ACB$ (angle opposite to the equal sides are equal)
$=> \angle PBC = \angle QCB$
$In\ \triangle PBC$ and $\triangle QCB$:
$PB = QC$ (proved above)
$\angle PBC = \angle QCB$ (proved above)
$BC = BC$ (common)
$By\ SAS$ congruence property :
$\triangle PBC \cong \triangle QCB$
$BQ = CP$ (corresponding parts of the congruent triangles)

Q12

Answer :

Given :
ABC is an isosceles triangle.
$AB = AC$
$BD = CE$
To prove :
$BE = CD$
Proof :
$AB + BD = AC + CE$ $(As,\ AB = AC,\ BD = CE)$
$=> AD = AE$
Consider $\triangle ACD$ and $\triangle ABE$:
$AC = AB$ (given)
$\angle CAD = \angle BAE$ (common)
$AD = AE$ (proved above)
By SAS congruence property :
$\triangle ACD \cong \triangle ABE$
$=> CD = BE$ (corresponding parts of the congruent triangles)

Q13

Answer :

Given :

$\triangle ABC$ is an isosceles triangle.

$AB = AC$

$BD = CD$

To prove :

AD bisects $\angle A$ and $\angle D$.

Proof :

Consider $\triangle ABD$ and $\triangle ACD$:

$AB = AC$ (given)

$BD = CD$ (given)

$AD = AD$ (common)

By SSS congruence property :

$\triangle ABD \cong \triangle ACD$

$=> \angle BAD = \angle CAD$ (by cpct)

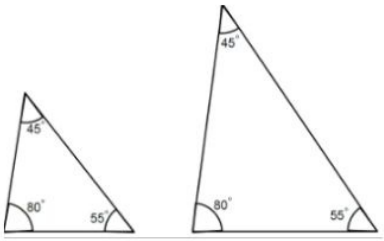
$=> \angle BDA = \angle CDA$ (by cpct)

Q14

Answer :

No, its not necessary. If the corresponding angles of two triangles are equal, then they may or may not be congruent.

They may have proportional sides as shown in the following figure:



Q15

Answer :

No, two triangles are not congruent if their two corresponding sides and one angle are equal. They will be congruent only if the said angle is the included angle between the sides.

********** END **********