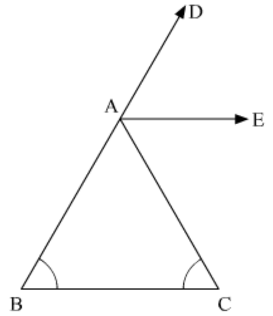
Triangles and Its Angles Ex 9.2 Q11

Answer :

In the given problem, AE bisects $\angle CAD$ and $\angle B = \angle C$

We need to prove $AE \parallel BC$



As, $\angle CAD$ is bisected by AE

$\angle CAD = 2\angle CAE = 2\angle DAE$ ....(1)

Now, using the property, "an exterior angle of a triangle in equal to the sum of the two opposite interior angles", we get,

$\angle CAD = \angle B + \angle C$

$\angle CAD = 2\angle C \ (\angle B = \angle C)$

$2\angle CAE = 2\angle C$ (using 1)

$\angle CAE = \angle C$

$\angle CAE = \angle ACB$

Hence, using the property, if alternate interior angles are equal, then the two lines are parallel, we get,

$\angle CAE = \angle ACB$

Thus, $\boxed{AE \parallel BC}$

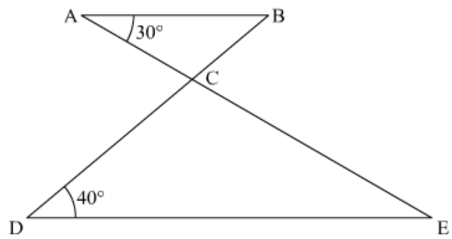
Hence proved.

Triangles and Its Angles Ex 9.2 Q12

Answer :

In the given problem, $AB \parallel DE$

We need to find $\angle ACD$



Now, $AB \parallel DE$ and AE is the transversal, so using the property, "alternate interior angles are equal", we get,

$\angle BAE = \angle AED$

$\angle AED = 30^\circ$

Further, applying angle sum property of the triangle

In ΔDCE

$$\angle DCE + \angle D + \angle E = 180^\circ$$
$$\angle DCE + 40^\circ + 30^\circ = 180^\circ$$
$$\angle DCE + 70^\circ = 180^\circ$$
$$\angle DCE = 180^\circ - 70^\circ$$
$$\angle DCE = 110^\circ$$

Further, ACE is a straight line, so using the property, "the angles forming a linear pair are supplementary", we get,

$$\angle ACD + \angle DCE = 180^\circ$$
$$\angle ACD + 110^\circ = 180^\circ$$
$$\angle ACD = 180^\circ - 110^\circ$$
$$\angle ACD = 70^\circ$$

Therefore, $\boxed{\angle ACD = 70^\circ}$.

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