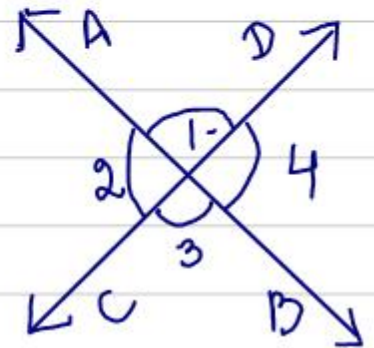


Solutions by Dev Anoop (Bathinda)

NCERT exemplar x ex 6.4 Page 1

① to prove $\angle 1 = \angle 3$
 $\angle 2 = \angle 4$



proof $\angle 1 + \angle 2 = 180^\circ \dots \textcircled{i}$
(linear pair axiom)

$$\angle 1 + \angle 4 = 180^\circ \dots \textcircled{ii} \text{ (do)}$$

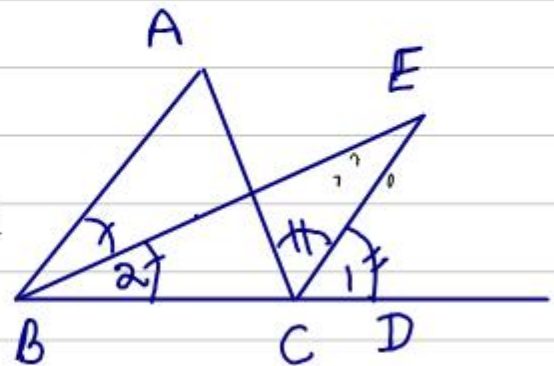
from ① and ②

$$\angle 1 + \angle 2 = \angle 1 + \angle 4$$

$$\Rightarrow \angle 2 = \angle 4$$

Similarly $\angle 1 = \angle 3$

② to prove $\angle BTC = \frac{1}{2} \angle BAC$



proof $\angle 1$ is exterior angle of $\triangle TBC$

$$\therefore \angle 1 = \angle T + \angle 2$$

$$(\times 2) \quad 2\angle 1 = 2\angle T + 2\angle 2$$

$$\Rightarrow \angle ACD = 2\angle T + \angle ABC \dots \textcircled{i} \left[\begin{array}{l} \because BT \text{ bis } \angle ABC \\ CT \text{ bis } \angle ACD \end{array} \right]$$

$\angle ACD$ is exterior angle of $\triangle ABC$

$$\therefore \angle ACD = \angle A + \angle ABC \dots \textcircled{ii}$$

From ①, ②

$$2\angle T + \angle ABC = \angle A + \angle ABC$$

$$\Rightarrow \angle BTC = \frac{1}{2} \angle BAC$$