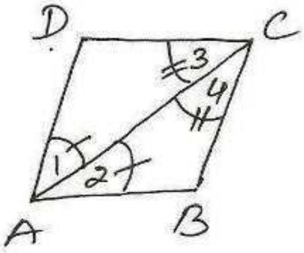
(17)



to prove $AB = AD$

$CB = CD$

proof

In $\triangle ABC$ and $\triangle ADC$

$\angle 1 = \angle 2$ (given)

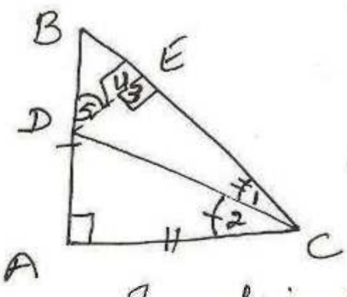
$AC = AC$

$\angle 3 = \angle 4$ (given)

$\therefore \triangle ABC \cong \triangle ADC$ by ASA prop.

$AB = AD$
$CB = CD$ (cpct)

(18)



given - In fig ABC is a rt. $\triangle$, $AB = AC$, CD is bisector of $\angle C$

to prove $BC = AD + AC$

Const - draw $DE \perp BC$

proof In rt $\triangle ABC$

$AB = AC$

$\therefore BC$ is hypotenuse

$\Rightarrow \angle A = 90°$

In $\triangle DAC$ and $\triangle DEC$

$\angle A = \angle 3 = 90°$

$\angle 1 = \angle 2$ (given)

$DC = DC$ (common)

$\therefore \triangle DAC \cong \triangle DEC$ by AAS cor.

$\therefore DA = DE$ (cpct) ---(i)

$CA = CE$ ---(ii) (do)

In $\triangle BAC$

$AB = AC$

$\Rightarrow \angle C = \angle B$ (isos $\triangle$ prop)

$\angle A + \angle B + \angle C = 180°$

$90 + 2\angle B = 180°$ [$\because \angle B = \angle C$]

$\Rightarrow 2\angle B = 90$

$\Rightarrow \angle B = 45°$

In $\triangle BED$

$\angle 5 = 180° - (\angle B + \angle 4)$

$= 180° - (45 + 90)$

$= 180 - 135$

$= 45°$

$\therefore \angle B = \angle 5$

$\Rightarrow DE = BE$ ---(iii) [converse of isos $\triangle$ prop]

from (i), (iii)

$DA = DE = BE$ ---(iv)

$BC = CE + BE$

$= CA + DA$ [using (ii), (iv)]

$\therefore BC = AD + AC$