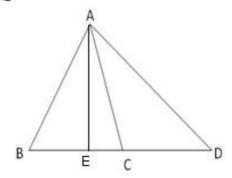


Exercise 4D

Question 18:



Const: Draw a perpendicular AE from A

Thus, AE \perp BC

Proof:

In $\triangle ABC$, AB = AC

And AE is a bisector of BC

Then, BE = EC

In right angle triangles \triangle AED and \triangle ACE

$$AD^2 = AE^2 + DE^2 - - - (1)$$

$$AC^2 = AE^2 + CE^2 - - - (2)$$

Subtracting (2) from (1),

$$\Rightarrow$$
 $(AD^2 - AC^2) = DE^2 - CE^2$

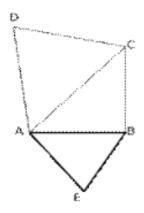
$$\Rightarrow AD^{2} - AC^{2} = (DE + CE)(DE - CE)$$
$$= (DE + BE)(DE - CE)[\because CE = BE]$$

$$\Rightarrow$$
 AD² - AC² = BD x CD

Hence proved.

Question 19:

Let AB = BC = x cm



By Pythagoras theorem,

$$AC^{2} = AB^{2} + BC^{2}$$

$$= x^{2} + x^{2}$$

$$AC^{2} = 2x^{2}$$

$$AC = \sqrt{2}x$$

$$\Delta ACD \approx \Delta ABE \qquad \text{(Given)}$$

$$\frac{ar\Delta ABE}{ar\Delta ACD} = \frac{AB^{2}}{AC^{2}} = \frac{x^{2}}{(\sqrt{2}x)^{2}}$$

$$= \frac{x^{2}}{2x^{2}} = \frac{1}{2} = 1:2$$
**********END *********