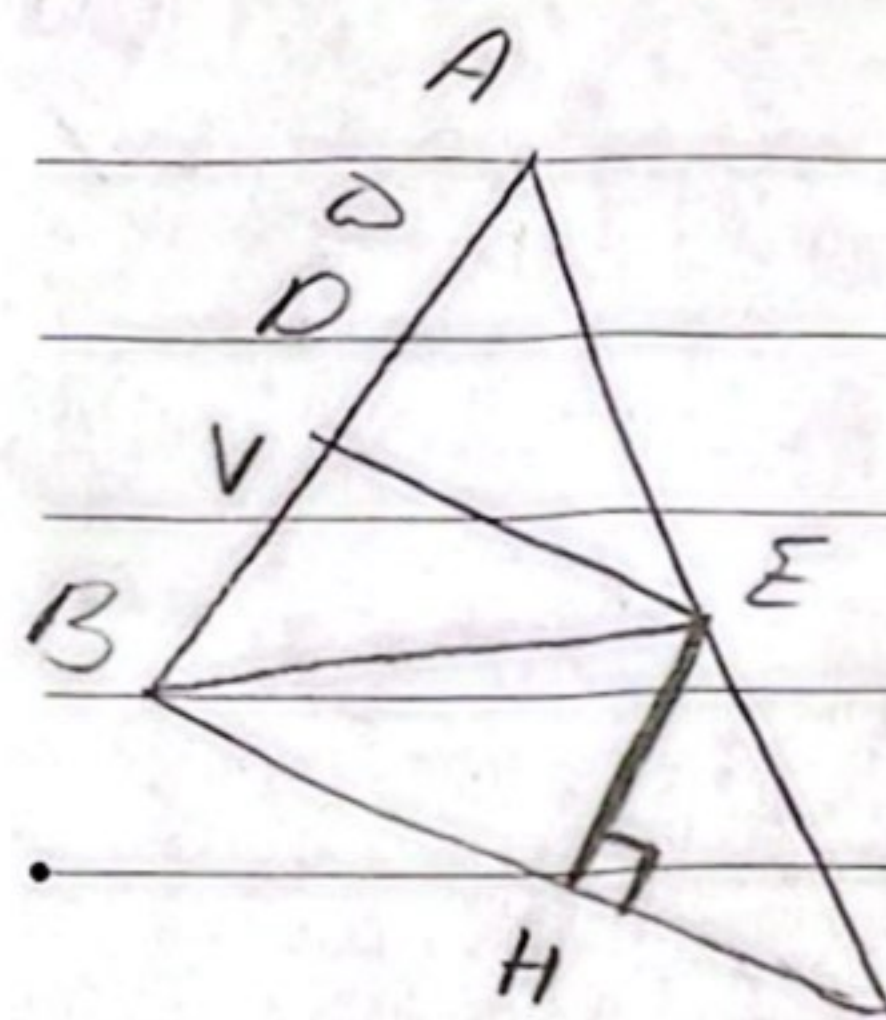
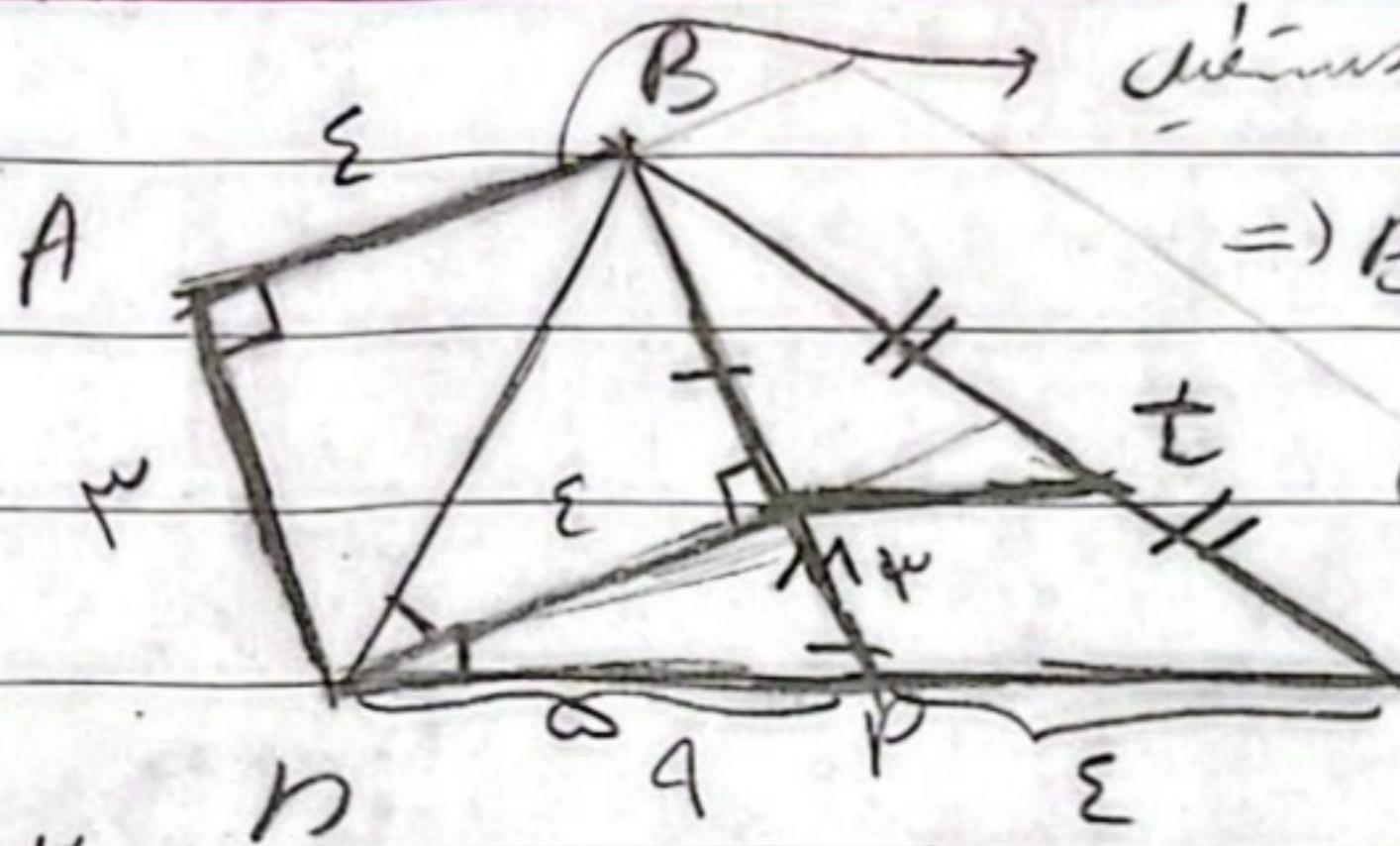




$$\left. \begin{array}{l} DE \parallel BC \\ EH \perp DE \end{array} \right\} \Rightarrow EH \perp BC \Rightarrow h_{\triangle BEC} = h_{\triangle BDE} \quad -1$$

$$DE \parallel BC \Rightarrow \frac{AD}{AB} = \frac{DE}{BC} = \frac{\omega}{12}$$

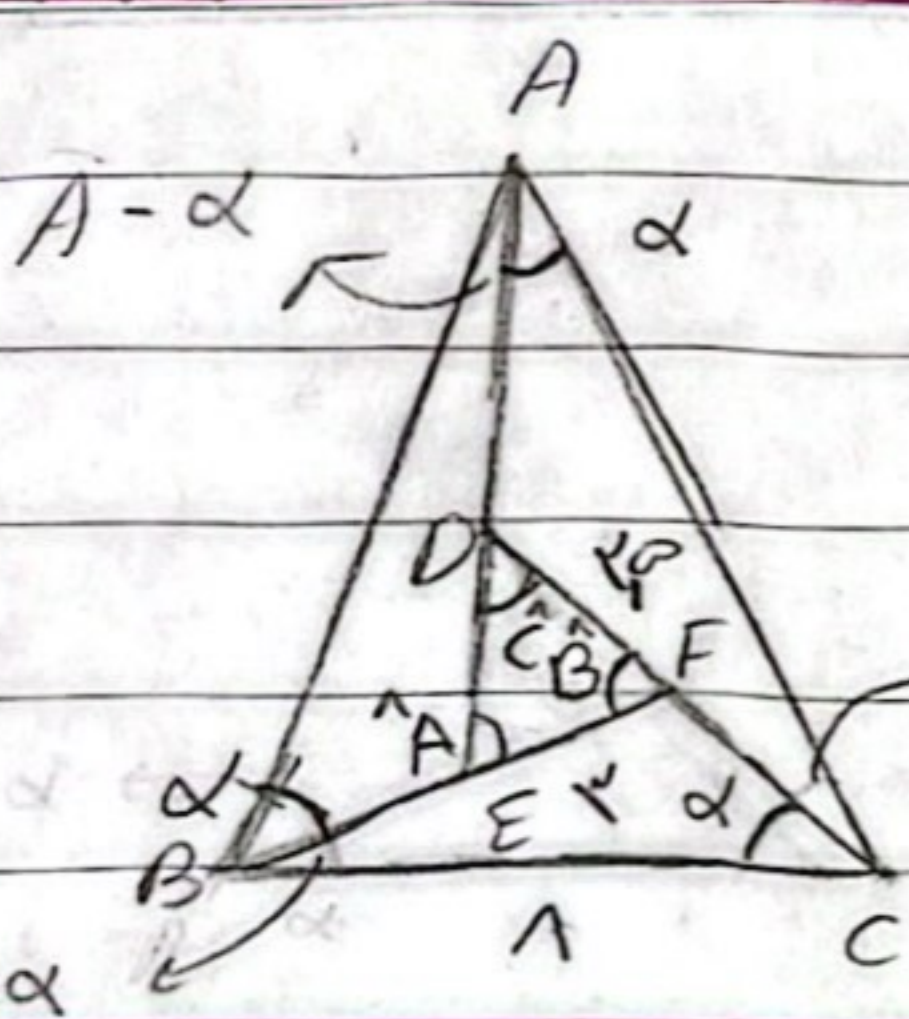
$$\Rightarrow \frac{\omega}{12} BC = DE \Rightarrow \frac{S_{BCE}}{S_{BDE}} = \frac{\frac{1}{2} \times BC \times h}{\frac{1}{2} \times DE \times h} = \frac{12}{\omega} \quad -2$$



$$\Rightarrow AB = 5, AD = 3, DM = 1, BM = 3 \Rightarrow BD = \omega \quad (BC \text{ بس } t)$$

$$DM \rightarrow \text{ارتفاع} \Rightarrow BDP \Rightarrow BM = MP = 3$$

$$m \parallel AC \Rightarrow \frac{ME}{PC} = \frac{BE}{BC} \Rightarrow \frac{1}{t} = \frac{1}{5} \Rightarrow ME = \frac{PC}{5} = \frac{5}{5} = 1 \Rightarrow ME = 1$$



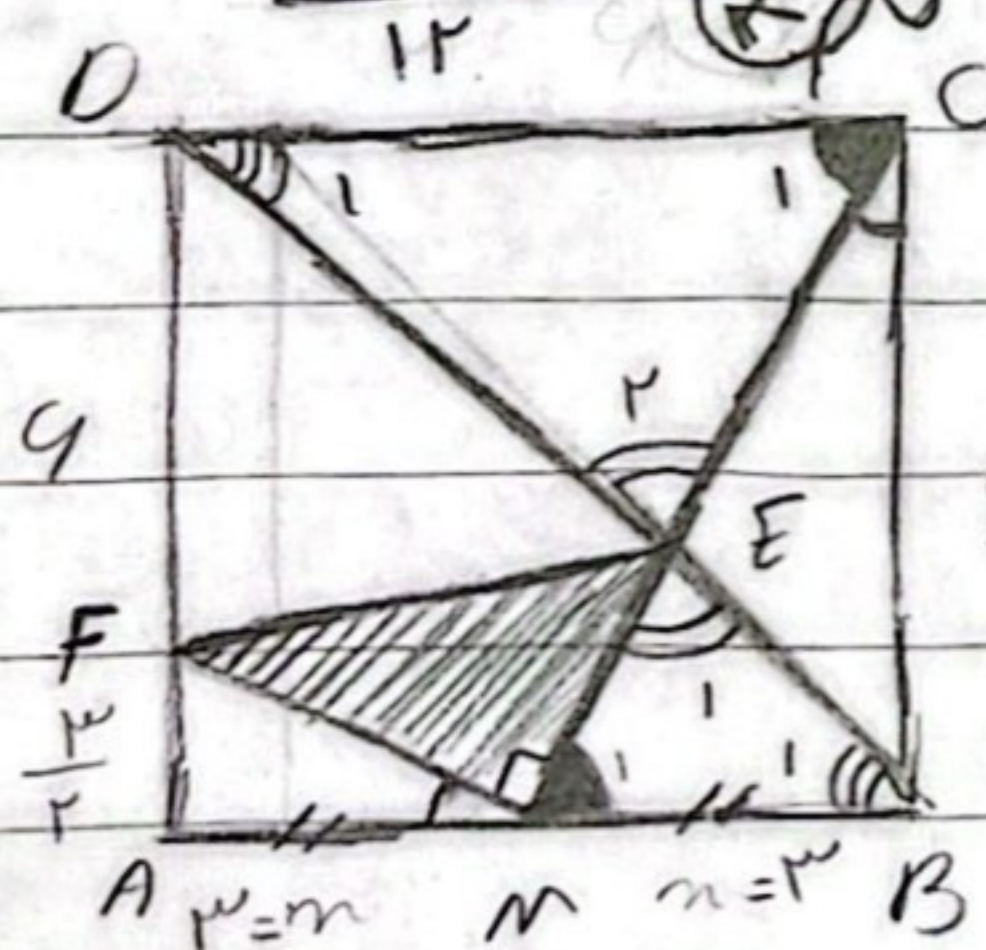
$$\angle FDE = \angle FBC \Rightarrow \angle FDE = \angle FBC - \alpha + \alpha = \angle B \quad -3$$

$$\angle FDE = \angle ADC \Rightarrow \angle FDE = \angle ADC - \alpha + \alpha = \angle C$$

$$\angle DEF = \angle ABE \Rightarrow \angle DEF = \angle ABE - \alpha + \alpha = \angle A$$

$$\Rightarrow \triangle ABC \sim \triangle DEF \Rightarrow \frac{12}{\omega} = \frac{3}{AB} \Rightarrow AB = \frac{3\omega}{12} = \frac{\omega}{4} \quad -4$$

$$S_{FEM} = \frac{3\sqrt{3}}{4} \times \sqrt{3} = \frac{9}{4} \Rightarrow BC^2 + MB^2 = MC^2 = 3^2 + 9 = 18 \Rightarrow \sqrt{18} = 3\sqrt{2}$$

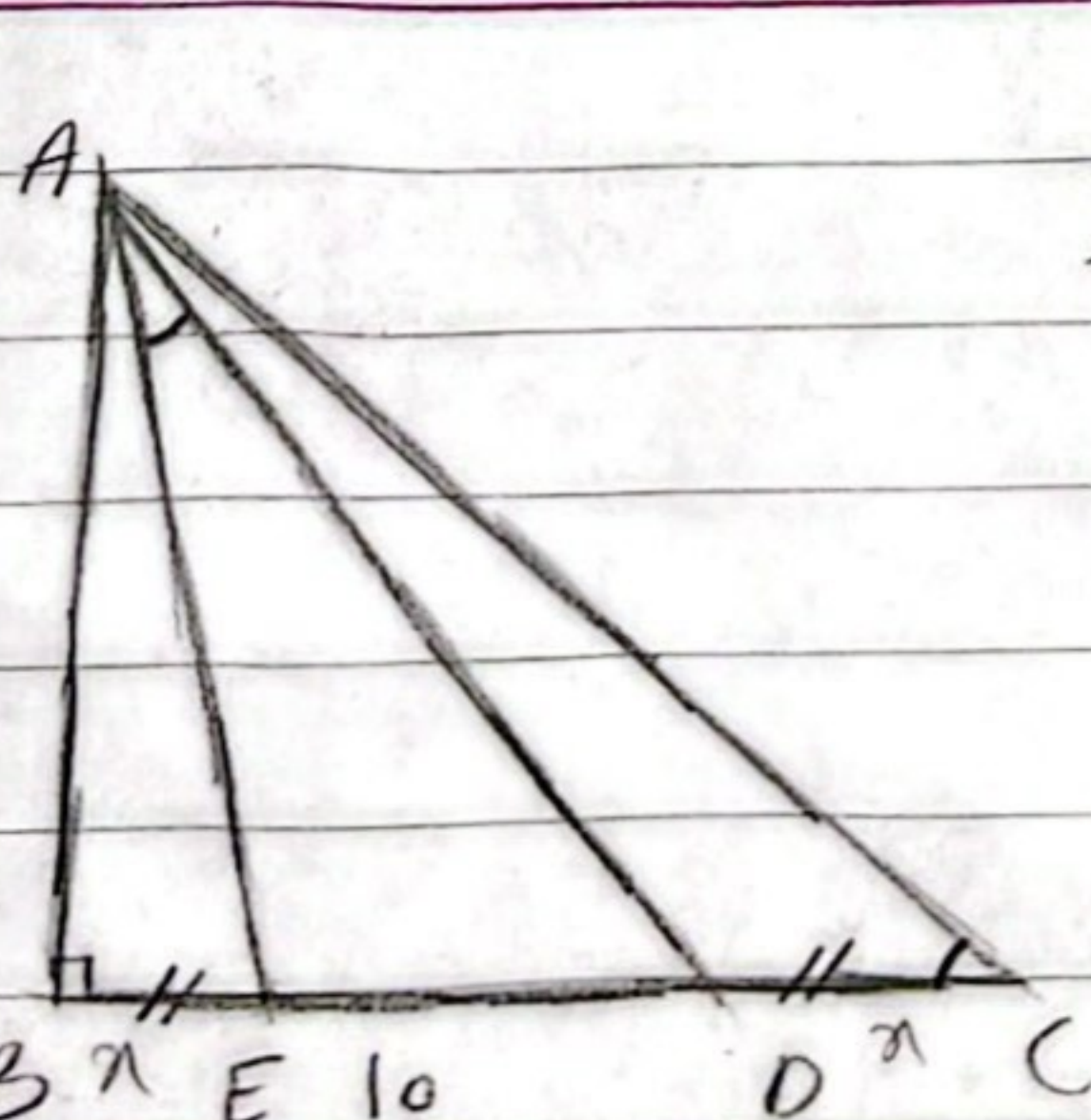


$$\left. \begin{array}{l} \angle BCE = \angle AMF \\ \angle B = \angle A = 90^\circ \end{array} \right\} \Rightarrow \triangle MBC \sim \triangle FAM$$

$$\Rightarrow \frac{AF}{AM} = \frac{AM}{MF} \Rightarrow AF = \frac{AM^2}{MF} = \frac{9}{MF}$$

$$E_1 = E_2, C_1 = M_1, B_1 = D_1 \Rightarrow ME \parallel BC \Rightarrow \angle ECD = \angle ECD$$

$$\Rightarrow \frac{BM}{EC} = \frac{EM}{EC} = \frac{1}{9} \Rightarrow EM = EC \Rightarrow EM + EC = 3\sqrt{2} \Rightarrow EM = \sqrt{2}$$



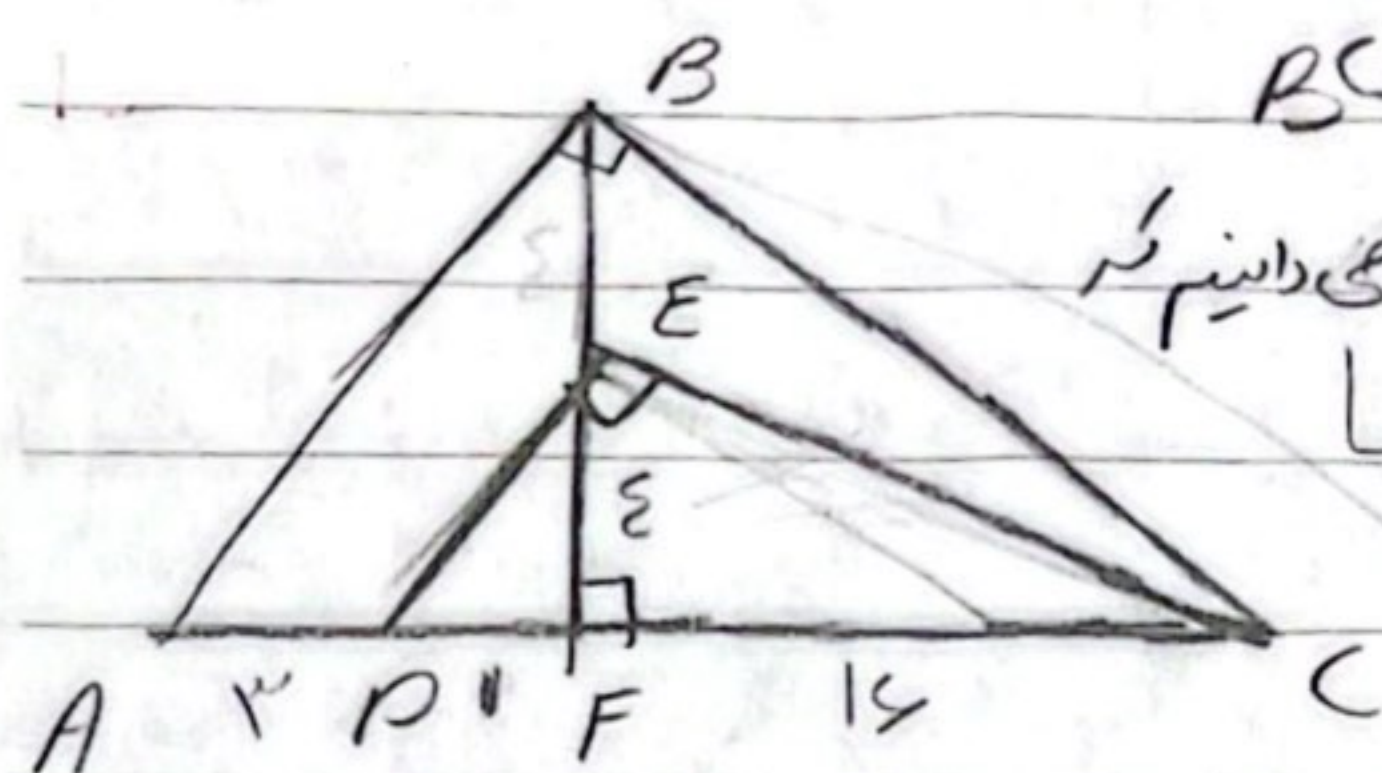
$$\left. \begin{array}{l} \angle E = \angle E \\ \angle DAE = \angle ACD \end{array} \right\} \Rightarrow \triangle AEC \sim \triangle AED \quad -5$$

$$\frac{ED}{AE} = \frac{AE}{ED} \Rightarrow 10 + 10 = 20$$

$$AE^2 = 10 + 10 = 20$$

$$\Rightarrow 10 + 10 = 20$$

$$n^2 - 10 + 10 = 0 \Rightarrow (n-3)(n-7) = 0 \Rightarrow n = 3 \text{ or } n = 7$$

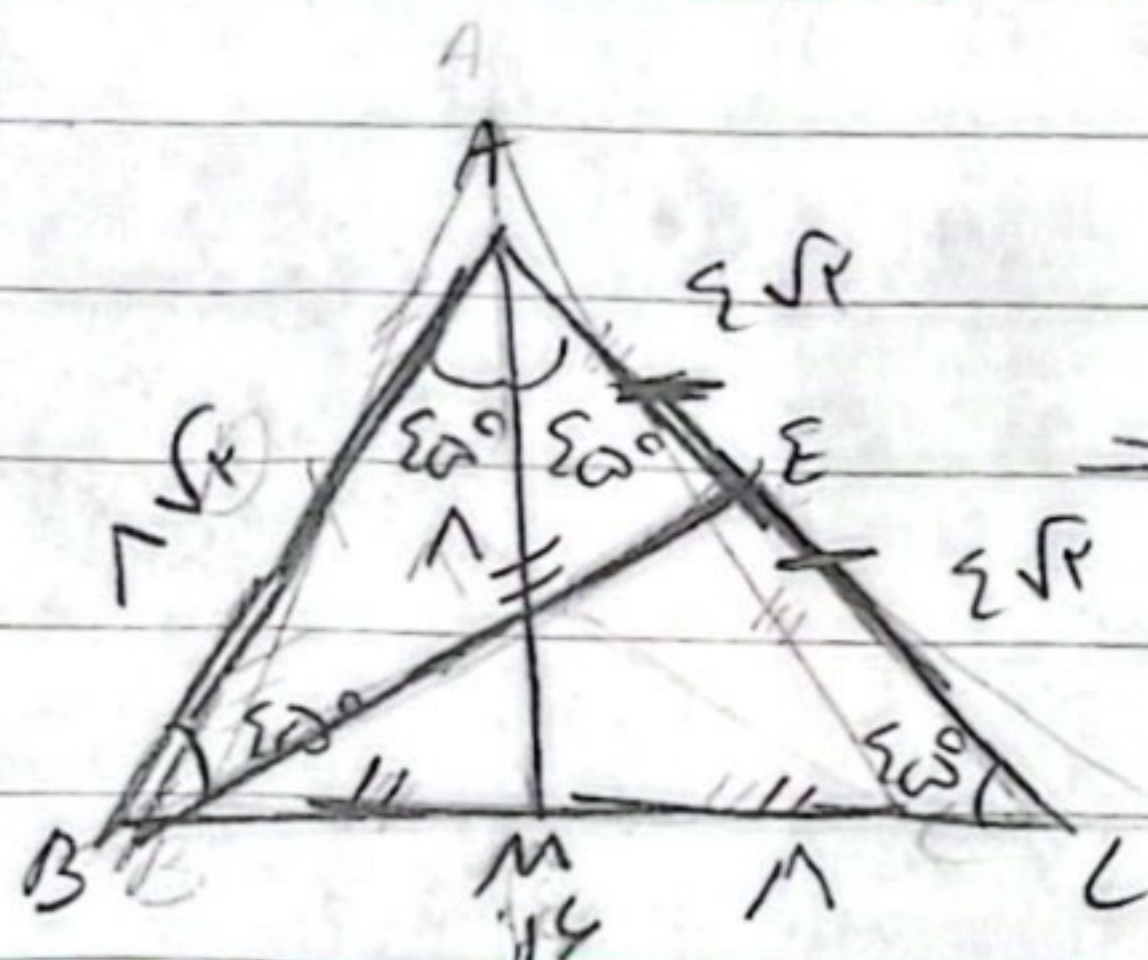


$$BC = 9$$

$$DF \times FC = EF^2 \Rightarrow 1 \times 14 = 14 \Rightarrow FC = 14$$

$$BC^2 = FC \times AC \Rightarrow 9 \times 14 = 126 \Rightarrow AC = 14$$

$$\Rightarrow 14 \times 14 = 196 \Rightarrow BC = \sqrt{196} = 14$$



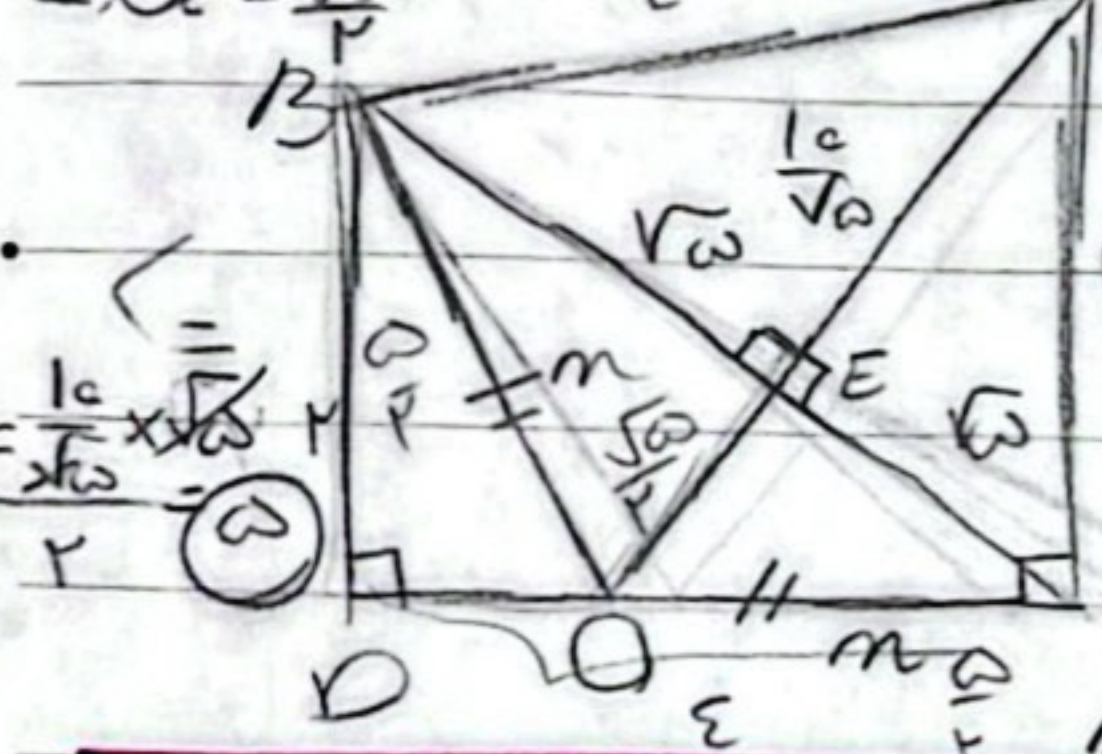
$$\Rightarrow A = 90^\circ$$

$$BE = \sqrt{10}$$

$$AM^2 + MC^2 = AC^2 \Rightarrow 4 + 4 = 16 \Rightarrow AC = 4\sqrt{2}$$

$$\Rightarrow AB^2 + AE^2 = BE^2 \Rightarrow 1 + 1 = 2 \Rightarrow BE = \sqrt{2}$$

$$\omega + OE = \frac{1}{2}\omega$$



$$A \quad AE \times OE = EC^2 \quad BD = 1 \quad CD = 2 \quad \angle C = 90^\circ$$

$$AE \times \sqrt{10} = \omega \quad (1) \quad BD^2 + OD^2 = OB^2 = \omega + OD^2 = m^2 = \omega + 14 + 2 - 2m = \omega$$

$$AE = \frac{10}{\sqrt{10}}$$

$$(2) \quad BD^2 + CD^2 = BC^2 = 10 \Rightarrow BC = \sqrt{10}$$

$$\vec{OB} = \vec{OC}, \vec{OE} = \vec{OE} \Rightarrow \angle OBE = \angle OCE$$

$$BE = EC \quad BE = \sqrt{10}$$

$$(3) \quad BE = BC - EC = 9 - \frac{9}{10} = \frac{81}{10}$$

$$BC = 9 \quad AC = 10$$

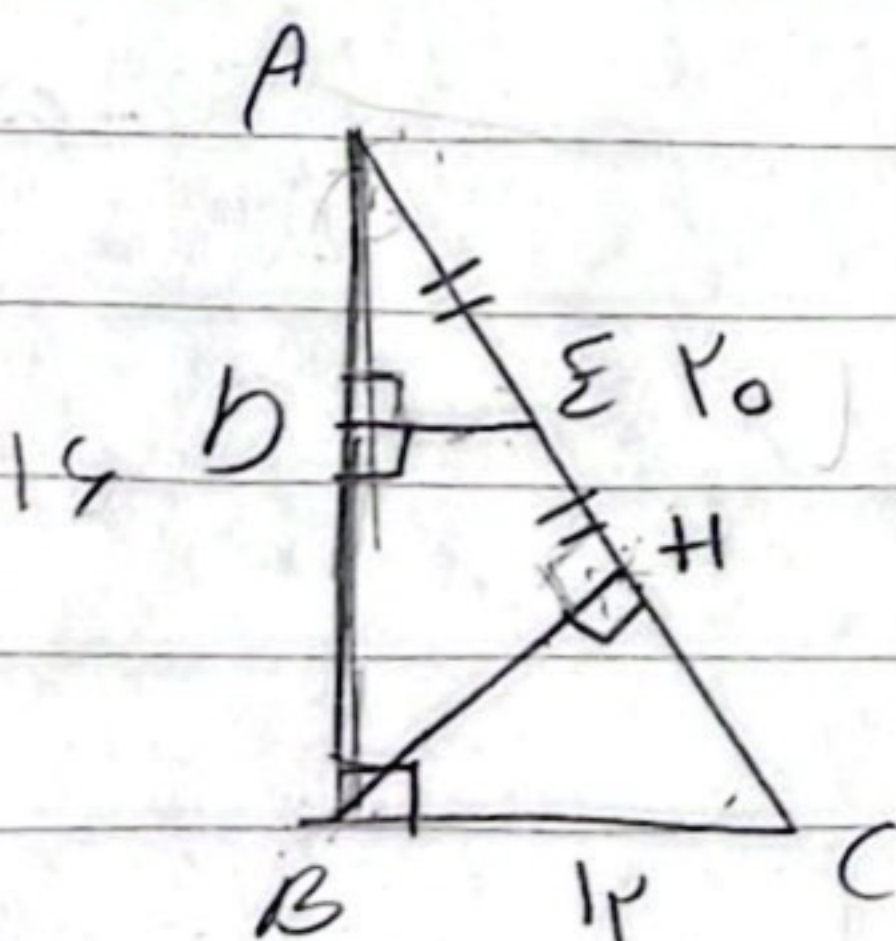
$$BC^2 + AC^2 = AB^2 \Rightarrow 81 + 100 = 161 \Rightarrow AB = \sqrt{161}$$

$$(4) \quad CD^2 = EC \times BC = \frac{9}{10} = 9 \times EC \Rightarrow EC = \frac{9}{10}$$

$$(5) \quad AC^2 = AD \times AB$$

$$9 = AD \times \sqrt{161} \Rightarrow AD = \frac{9}{\sqrt{161}}$$

$$\Rightarrow AD^2 + CD^2 = AC^2 \Rightarrow \frac{81}{161} + CD^2 = 9 \Rightarrow 9 - \frac{81}{161} = \frac{1458}{161} = CD^2$$



$$AB = 14 \quad BC = 12 \quad DE = 9$$

$$\left. \begin{array}{l} \angle D = 90^\circ, \angle H = 90^\circ \\ \angle A = \angle A \end{array} \right\} \Rightarrow \triangle ADE \cong \triangle ABH \Rightarrow \frac{DE}{BH} = \frac{AE}{AB}$$

$$S = 14 \times 12 = 99 \Rightarrow AC \times BH = 99 \Rightarrow BH = 9.9$$

$$14^2 = AH \times 10 \Rightarrow AH = 19.6 \Rightarrow AE = 9.9$$

$$\frac{DE}{9.9} = \frac{9.9}{14} \Rightarrow DE = 7.11$$