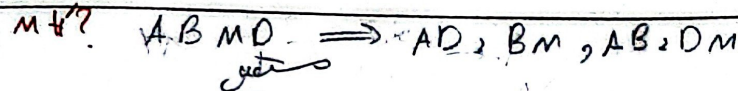


$$DE \parallel BC \quad \frac{AD}{AB} = \frac{DE}{BC} = \frac{1}{2} \Rightarrow DE = \frac{1}{2} BC$$



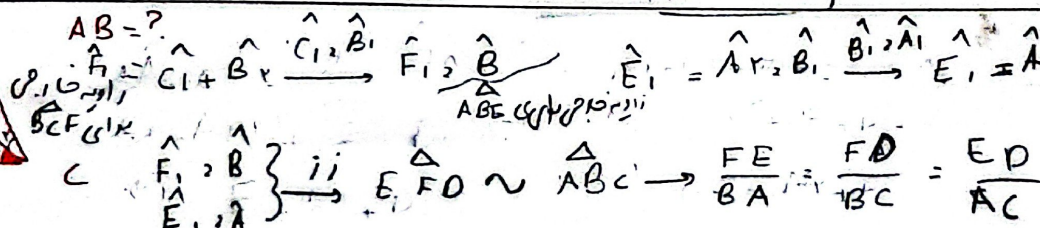


$$\left. \begin{aligned}
 \hat{M}_1, \hat{M}_2 = 9^\circ \\
 \hat{D}_1, \hat{D}_2 = \alpha \\
 \hat{O}_M, \hat{P}_M
 \end{aligned} \right\} \rightarrow \Delta H M \cong \Delta M B \rightarrow \begin{aligned} & H M, M B \\ & D H, D B = \omega \end{aligned}$$

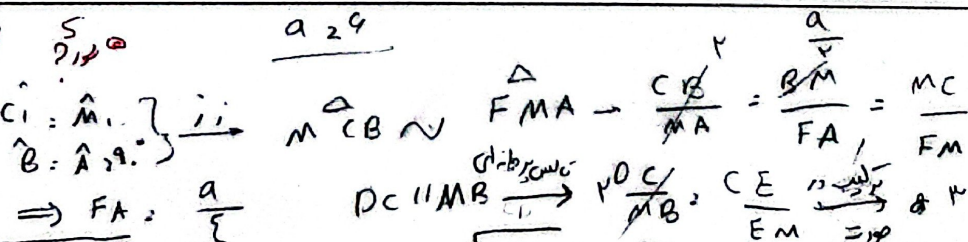
$$H C : O C - P H = 9 - \omega = r$$

$$\frac{B M}{M H} = \frac{B H'}{H C} \xrightarrow{\text{similarity}} M H' \parallel H C \xrightarrow{\text{similarity}} \frac{M B}{B H} = \frac{M H'}{H C} = \frac{1}{r} = \frac{M H}{r}$$

$M H' = r$

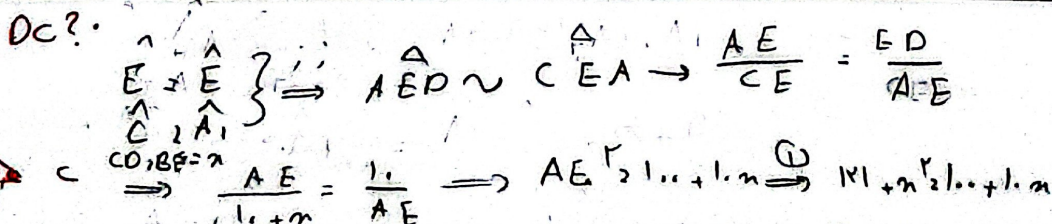


$$\frac{P}{BA} = \frac{P_1 \omega}{A} \rightarrow BA = \frac{P \times A}{\frac{P_1 \omega}{A}} = \frac{P \times A^2}{P_1 \omega} = \frac{2 \times 10^4 \times 10^4}{1000 \times 1000} = 200$$

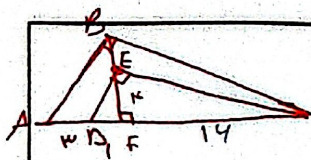


$$F_M \xrightarrow{2r} F_{M2} \sqrt{F_A + AM^2} = \sqrt{10} a \quad , \quad CM_2 = \sqrt{CB^2 + BM^2} = \frac{\sqrt{10}}{2} a \rightarrow EM = \frac{\sqrt{10}}{4} a$$

$$S_{MEF} = \frac{1}{2} F_M \times EM = \frac{\sqrt{10} \times 4}{2} \times \frac{\sqrt{10} \times 1}{4} = \frac{10}{2}$$



$$ABE \rightarrow A E^T_2 B E^T_1 + 11^T_2 11^T_1 + \lambda^T \quad (1)$$

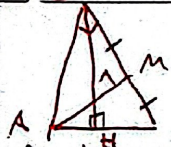


BC?

$$EF^2 = DF \times FC \rightarrow 14 \times FC \rightarrow FC = 14$$

$$BC^2 = CF \times CA \rightarrow BC^2 = 14 \times 20 \rightarrow \boxed{BC = 14\sqrt{5}}$$

B



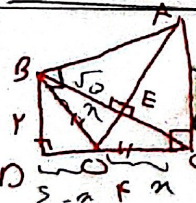
AM?

من مانه نفق باده است من الزاوية

$$BC^2 = AC^2 \Rightarrow BC = 14\sqrt{2} = AB \Rightarrow M = \sqrt{2}$$

$$AMB \text{ قائم } = AM^2 + MB^2 + AB^2 \Rightarrow AM^2 + 12^2 + 2^2 = 14^2$$

$$AM = \sqrt{10}$$



ABE?

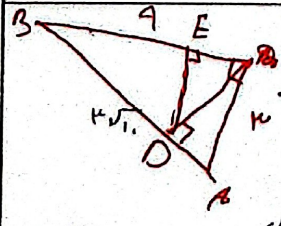
$$(x-m)^2 + 2^2 = 14^2 - 12^2 \Rightarrow x = 14$$

$$OC = OB \Rightarrow BE = EC = \sqrt{5}$$

$$BC^2 = BD^2 + DC^2 \Rightarrow BC = 2\sqrt{5} \Rightarrow BOE \Rightarrow BO = BE = OE \Rightarrow E = \frac{\sqrt{5}}{2}$$

$$BE^2 = OE \times EA \Rightarrow 5 = \frac{\sqrt{5}}{2} \times EA \Rightarrow EA = 2\sqrt{5}$$

$$S_{ABE} = \frac{1}{2} BE \times EA = \frac{1}{2} \times 2\sqrt{5} \times \sqrt{5} = 5$$

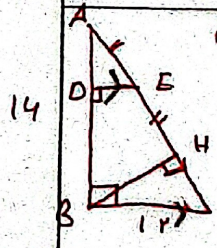


BE?

$$AB^2 = CB^2 + AC^2 \Rightarrow AB = 2\sqrt{10}$$

$$\triangle ABC \Rightarrow BC^2 = AB \times BD \Rightarrow 11 \times \sqrt{10} \times BD \Rightarrow BD = \sqrt{10}$$

$$\triangle COB \Rightarrow BD^2 = BC \times BE \Rightarrow \frac{10}{11} = 4 \times BE \Rightarrow \boxed{BE = \frac{5}{11}}$$



DE?

$$\hat{D} = \hat{B} \Rightarrow DE \parallel BC \Rightarrow \frac{DE}{BC} = \frac{AE}{AC} \Rightarrow \frac{DE}{12} = \frac{4}{20} \Rightarrow DE = \frac{4}{5}$$

$$\boxed{DE = \frac{4}{5}}$$

$$\triangle ABC \Rightarrow AC^2 = BA^2 + BC^2 \Rightarrow AC = 20$$

$$\triangle ABC \Rightarrow BC^2 = CH \times AC \Rightarrow 12^2 = CH \times 20 \Rightarrow CH = \frac{18}{5}$$

$$\Rightarrow AE = \frac{12 \times 11}{20} = \frac{33}{5}$$