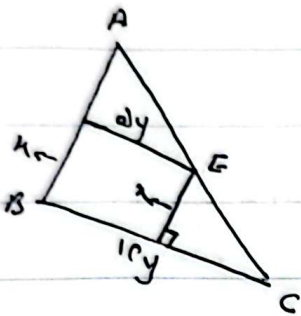


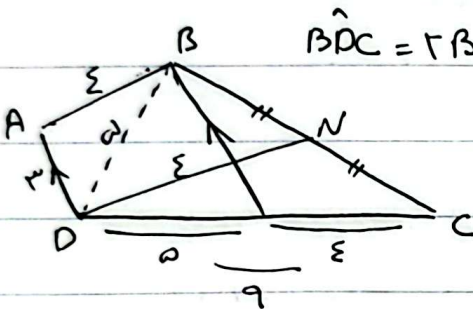
مسئله ۱۲

اصطلاحات



$$\frac{S_{ABC}}{S_{ADE}} = \frac{1}{4}$$

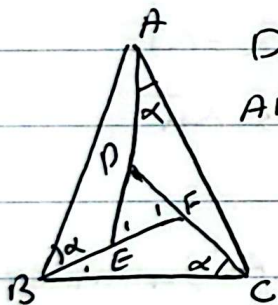
1.



$$\hat{BDC} = \hat{BDM}$$

$$\frac{4}{9} = \frac{x}{E} \rightarrow x = 2$$

2.



$$DF = FD \quad EF = F$$

$$ABE = CAE = BCD$$

$$\frac{1}{4} = \frac{AB}{F} \rightarrow AB = 4 \cdot \frac{1}{4}$$

$$F = \alpha + \beta = \beta$$

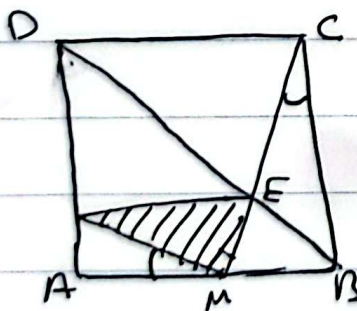
$$E_1 = A_1 + \alpha = A$$

$$F_1 = \beta$$

$$E_1 = A$$

$$\frac{ABC}{DEF} \sim \frac{BC}{DF} = \frac{AB}{EF}$$

3.



$$\hat{BCE} = \hat{AMF}$$

$$CD \parallel MB \rightarrow CDE \sim EMB$$

$$\frac{CE}{ME} = \frac{CD}{MB} \rightarrow \frac{CE}{ME} = \frac{4}{F} = 1 \rightarrow CE = F$$

$$CM = CE + ME = 2ME$$

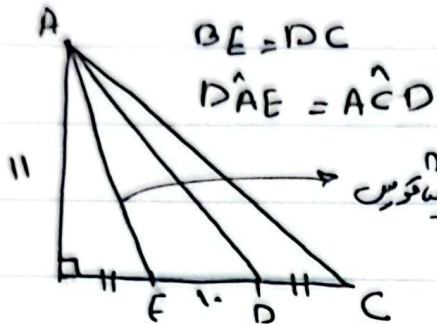
$$CM^2 = CB^2 + BM^2 \rightarrow 4ME^2 = 4 + 4 = 8$$

$$S_{EFM} = \frac{1}{2} MF \times ME = \frac{1}{2} \times \frac{1}{2} \sqrt{2} \times \sqrt{2} = 1$$

$$\frac{1}{2} = \frac{1}{2} \sqrt{2}$$

4.

DAT.



$$BE = DC$$

$$\angle AEB = \angle ACD$$

$$\triangle AED \sim \triangle AEC$$

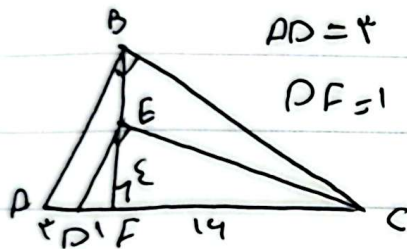
5

$$\frac{AD}{AE} = \frac{AE}{EC} \Rightarrow \frac{11}{AE} = \frac{AE}{EC}$$

$$\frac{\sqrt{n^2 + 1}}{1+n} = \frac{1}{\sqrt{n^2 + 1}}$$

$$n^2 + 1 = 1 + n^2$$

$$n^2 - 1 + 1 = 0 \Rightarrow n = 1 \text{ or } n = -1$$



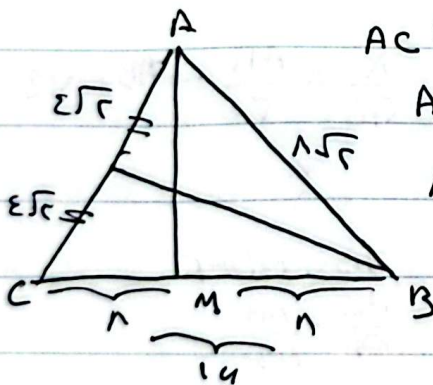
$$AD = 4 \quad EF = 1$$

$$DF = 1$$

$$EF^2 = DF \cdot FC \Rightarrow 1 = 1 \cdot FC$$

$$BC^2 = 14 \cdot 1 \Rightarrow BC = \sqrt{14}$$

6



$$AC^2 = CM^2 + AM^2 \Rightarrow AC = \sqrt{1+16} = \sqrt{17}$$

$$AB^2 = MB^2 + AM^2 \Rightarrow AB = \sqrt{17}$$

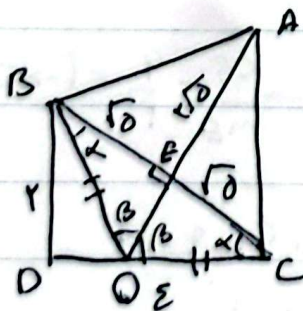
$$AM = \frac{14}{4} = \frac{7}{2}$$

$$AB^2 + BC^2 = 2(BN^2 + AN^2) \Rightarrow 17 + 17 = 2(BN^2 + \frac{49}{4})$$

$$17 = BN^2 + \frac{49}{4} \Rightarrow BN^2 = \frac{19}{4} \Rightarrow BN = \frac{\sqrt{19}}{2}$$

$$BN = \frac{\sqrt{19}}{2}$$

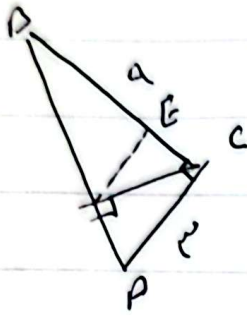
7



$$\tan \alpha = \frac{1}{\sqrt{2}}$$

$$S_{ABH} = \frac{1}{2}$$

8



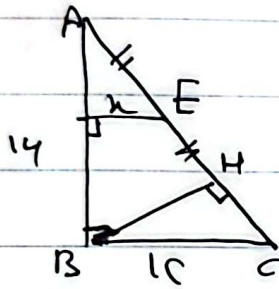
$$BA \xrightarrow{\text{منسوب}} 3\sqrt{10}$$

$$DC = \frac{3 \times 14}{3\sqrt{10}} = \frac{14}{\sqrt{10}}$$

$$\left(\frac{14}{\sqrt{10}}\right)^2 = CE \times 14 \rightarrow CE = \frac{14}{10}$$

$$BE = 1.1$$

9.



$$BH = \frac{10 \times 14}{10} = \frac{14}{1}$$

$$10^2 = HC \times 14 \rightarrow HC = \frac{100}{14}$$

$$\frac{x}{\frac{100}{14}} = \frac{10}{14} \rightarrow x = 3.18$$

10.

اصحاب دانش