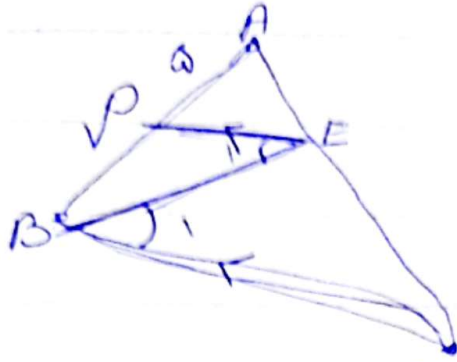




$$BC \parallel DE \rightarrow \frac{DE}{BC} = \frac{\sin \theta}{\sin \theta} = \frac{1}{1} \quad (1)$$

$$\angle BCE = ? \quad \angle BDE$$

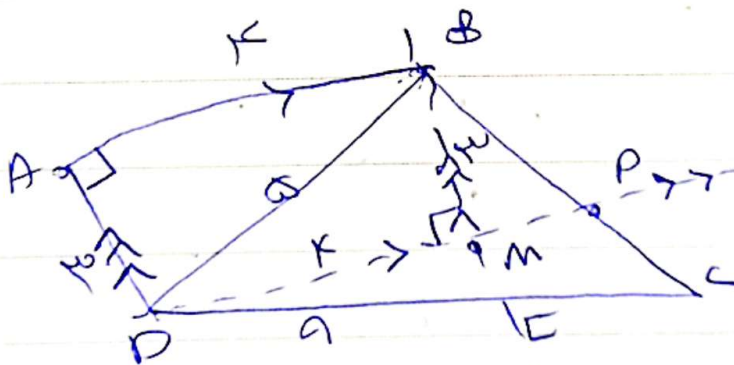


$$BC \parallel DE \Rightarrow \hat{E}_1 = \hat{B}_1 \rightarrow \angle BCE = EB \times CB \times \frac{1}{r} \times \sin \theta$$

$$\angle BDE = DE \times BE \times \frac{1}{r} \times \sin \theta$$

$$\frac{DE}{BC} = \frac{\sin \theta}{\sin \theta} \Rightarrow BE \times \frac{\sin \theta}{\sin \theta} = PE$$

$$\frac{BE \times CB \times \frac{1}{r} \times \sin \theta}{\frac{\sin \theta}{\sin \theta} \times BE \times BE \times \frac{1}{r} \times \sin \theta} = \frac{1}{1} = \boxed{1}$$



$$AB \parallel DC \rightarrow \hat{B} = \hat{D} \quad (2)$$

$$\rightarrow B + D = D$$

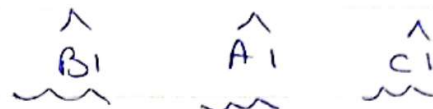
$$BD = a$$

$$BD = \text{---} \quad \hat{B} = \hat{D} = 4 \hat{A} \hat{O} \hat{B} = \hat{O} \hat{B} \hat{E} \rightarrow \triangle ABD \cong \triangle BMD \Rightarrow \hat{M} = 90^\circ$$

DM

$$\hat{O}_1 = \hat{O}_2 \quad \hat{M} = 90^\circ \quad \triangle DMB \cong \triangle DME \Rightarrow DE \leq \delta, EC = \epsilon, ME \leq \text{---}$$

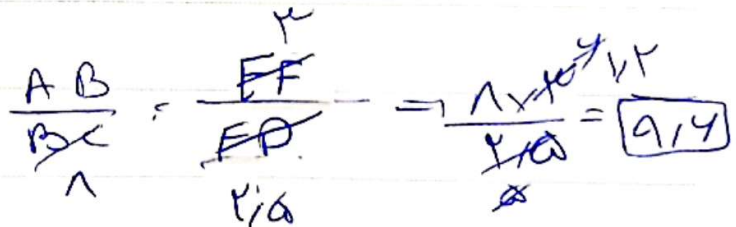
$$\Rightarrow \frac{MP}{Ec} = \frac{BP}{Bc} \cdot \frac{BM}{BE} = \frac{1}{r} \Rightarrow MP, \frac{1}{r} \times 2 = \boxed{P}$$

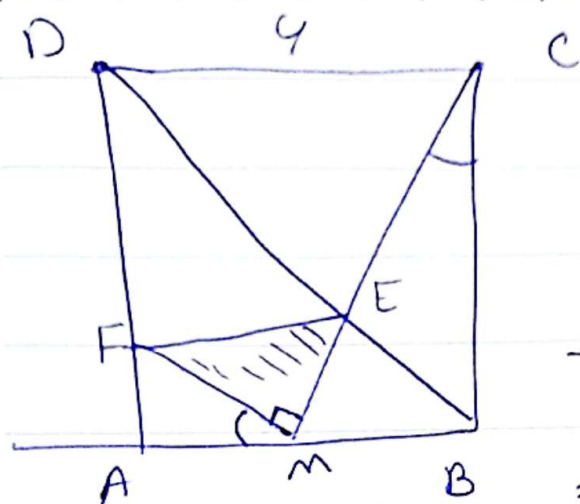


$$DF \subseteq \Psi, \omega \quad EF = \Psi$$

$$\left. \begin{aligned} \hat{C}_1 &= \hat{B}_1 \mp \hat{A}_1 \Rightarrow \hat{D}_1 = \hat{C}_1 + \hat{A}_1 \\ &\left\{ \begin{aligned} \hat{E}_1 &= \hat{A}_1 + \hat{A}_1 \\ \hat{F}_1 &= \hat{B}_1 + \hat{B}_1 \end{aligned} \right\} \end{aligned} \right\}$$

میتوانیم EDF به راحتی متزایه مشابه بسازیم.





$$BM = AM = \frac{3}{2}$$

$$BM \parallel DC \Rightarrow \triangle BME \sim \triangle DEC$$

$$\Rightarrow \frac{ME}{CE} = \frac{BM}{DC} = \frac{\frac{3}{2}}{4} = \frac{3}{8}$$

$$\Rightarrow BC^2 = CM^2 = BC^2 + BM^2$$

$$\Rightarrow 4^2 + 3^2 = EC^2 \Rightarrow CM = \frac{5}{2} \Rightarrow ME = \frac{3}{2} \Rightarrow CE = \frac{5}{2}$$

$$\triangle AMF \sim \triangle BCM \Rightarrow \frac{AM}{BC} = \frac{MF}{MC} \Rightarrow \frac{3}{4} = \frac{MF}{\frac{5}{2}}$$

$$MF = \frac{3}{4} \times \frac{5}{2} = \frac{15}{8}$$

$$S_{\triangle FME} = \frac{1}{2} \times ME \times MF = \frac{1}{2} \left(\frac{3}{2} \times \frac{15}{8} \right)$$

$$= \frac{15}{8} = \boxed{\frac{15}{8}}$$

$$ABE \Rightarrow AE^2 = AB^2 + BE^2 \Rightarrow 11^2 + n^2 \Rightarrow AE = \sqrt{121 + n^2} \quad (1)$$

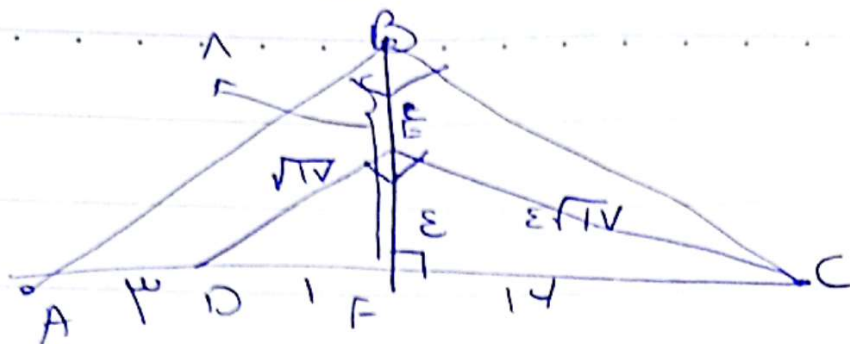
$$\triangle AEC \sim \triangle ACD \Rightarrow \frac{AE}{ED} = \frac{EC}{AC} \Rightarrow AE^2 = ED \times EC$$

$$\Rightarrow 121 + n^2 = 100 + 10n \Rightarrow$$

$$n^2 - 10n + 21 = 0$$

$$(n-4)(n-7) = 0 \Rightarrow$$

$$n = \frac{10 \pm \sqrt{100 - 84}}{2} = \frac{10 \pm 4}{2}$$



(4)

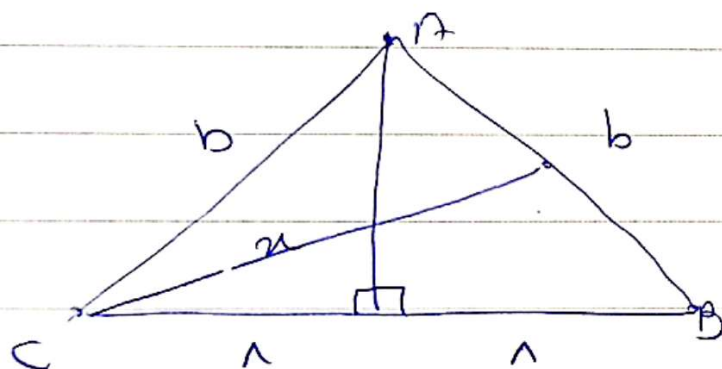
5

$$ED \leq \sqrt{1+14} = \sqrt{15}$$

$$EF^2 = DF \times FC \Rightarrow FC \leq 14 \Rightarrow EC \leq \sqrt{15}$$

$$BF^2 = 1 \times 14 \Rightarrow BF \leq \sqrt{14} \leq 1$$

$$BC^2 = 1^2 + 14^2 = 197 \Rightarrow BC \leq 1\sqrt{197}$$

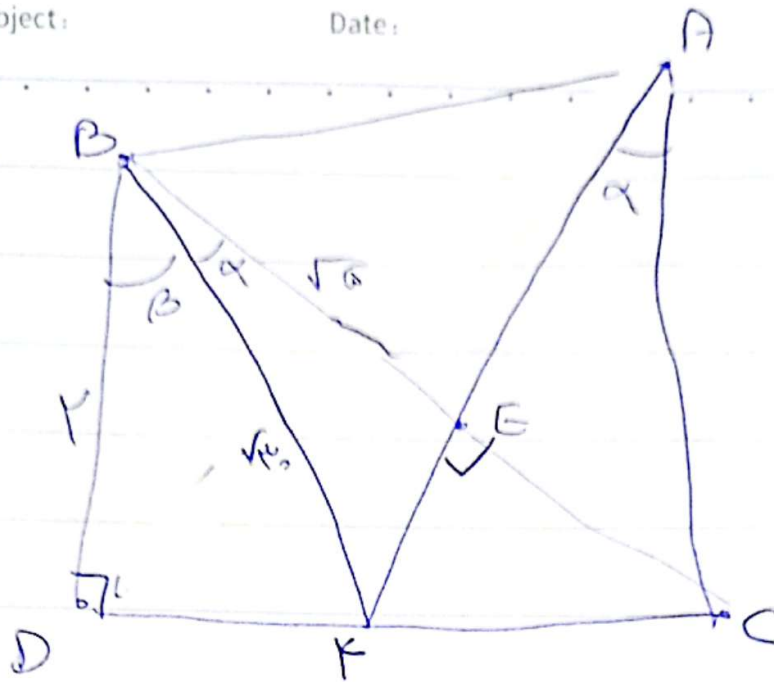


(5)

5

$$b^2 + b^2 = 14^2 \Rightarrow b^2 = 196 \Rightarrow b = \sqrt{196} = 14$$

$$\sqrt{(1\sqrt{197})^2 + (5\sqrt{15})^2} = 197 + 375 = \sqrt{572} = \boxed{2\sqrt{143}}$$

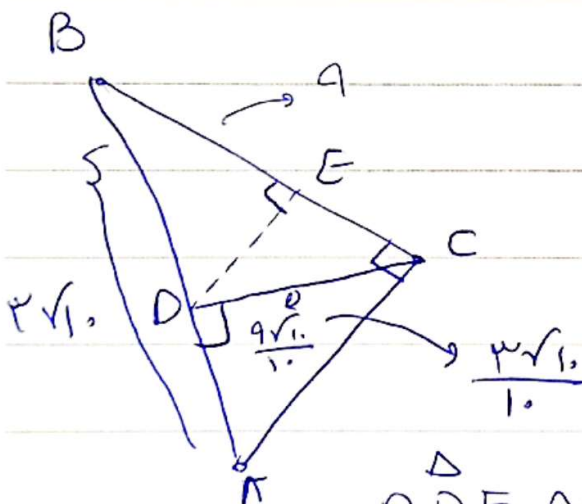


$$BC = \sqrt{1+14} + \sqrt{10} = \sqrt{15} = \sqrt{10}$$

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

$$\frac{1}{\sqrt{10}} = \frac{1}{AE} \rightarrow AE = \sqrt{10} \Rightarrow \Delta ABE \sim \frac{AE \times CE}{1}$$

$$= \frac{1 \times \sqrt{10}}{1} = 10$$



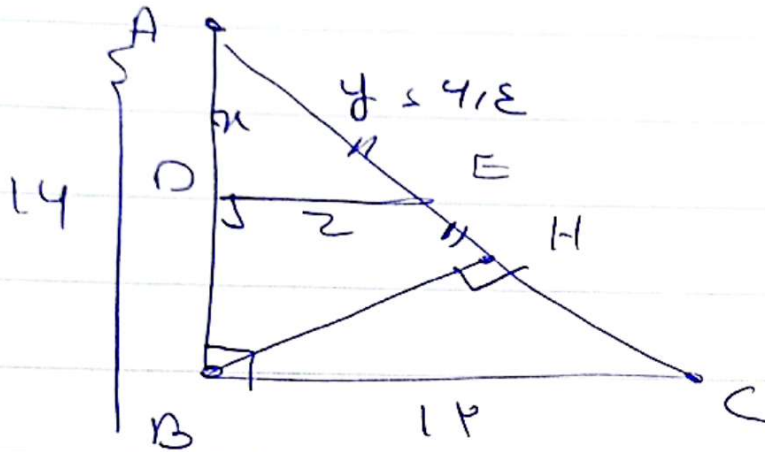
$$\Delta ADC \sim \Delta ABC \rightarrow \frac{AC}{AB} = \frac{AD}{AC} = \frac{DC}{BD}$$

$$\frac{1}{\sqrt{10}} = \frac{AD}{1} = \frac{DC}{9}$$

$$\Delta BDE \sim \Delta ABC \rightarrow \frac{ED}{AC} = \frac{EB}{BD} = \frac{BD}{BA}$$

$$\rightarrow \frac{ED}{1} = \frac{EB}{9} = \frac{1 - AD}{\sqrt{10}} \rightarrow EB \times \sqrt{10} = 9(1 - \frac{1}{\sqrt{10}})$$

$$EB \times \sqrt{10} = 9 \times \frac{1 \times \sqrt{10}}{10} \Rightarrow \boxed{EB = 1/1}$$



$$\triangle ABC \sim \triangle ADE \rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{x}{14} = \frac{4/5}{17} = \frac{2}{17}$$

$$\triangle ABC \sim \triangle BEC \rightarrow \frac{BE}{AB} = \frac{EC}{BC} = \frac{BC}{AC} \Rightarrow \frac{BE}{14} = \frac{17 - 4/5}{17} = \frac{16/5}{17}$$

$$\rightarrow 17(17 - 4/5) = 11 \times 17 \rightarrow 17 - 4/5 = 11$$

$$\rightarrow \frac{4/5}{17} = \frac{2}{17} \Rightarrow 2 = \frac{4/5 \times 17}{17} \Rightarrow \boxed{17/18}$$