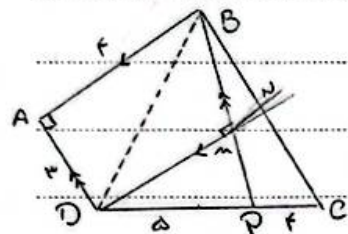


$$\frac{DE}{BC} = \frac{AD}{AB} = \frac{a}{12}$$

$$\frac{S_{\triangle BCE}}{S_{\triangle ADE}} = \frac{\frac{1}{2}h \times BC}{\frac{1}{2}h \times DE} = \frac{12}{a} = 12$$

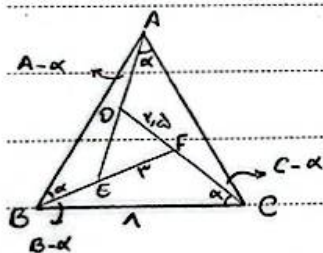


في مثلث BDE، DM هو ارتفاع من D إلى BC، DM هو ارتفاع BDE، مثلث BDE.

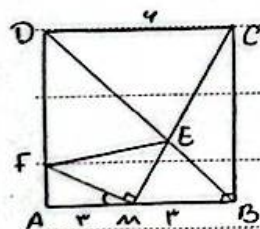
$$BD^2 = AB^2 + AD^2 = 12^2 + 4^2 = 160 \rightarrow BD = 4\sqrt{10}$$

$$BDE \rightarrow BD = DE = a \quad PC = DC - DE = 4 - a = 6$$

$$\frac{BM}{MP} = \frac{BN}{NC} \rightarrow MN \parallel PC \Rightarrow \frac{MN}{PC} = \frac{1}{4} \rightarrow MN = 1$$



$$\frac{12a}{1} = \frac{1}{2} \rightarrow a = 9,4$$



$$BM \parallel CD \rightarrow BME \sim DEC \rightarrow \frac{ME}{CE} = \frac{BM}{DC} = \frac{1}{4} \Rightarrow \frac{1}{2}$$

$$\Rightarrow BCM : MC^2 = BC^2 + BM^2 = 12^2 + 4^2 = 160 \rightarrow CM = 4\sqrt{10}$$

$$\Rightarrow ME = \sqrt{10} \quad CE = 2\sqrt{10}$$

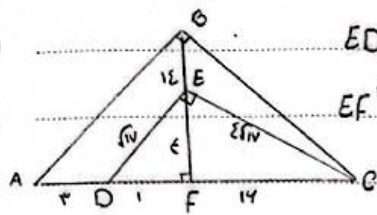
$$AMF \sim BCM \Rightarrow \frac{AM}{BC} = \frac{MF}{MC} = \frac{1}{4} = \frac{MF}{4\sqrt{10}} \rightarrow MF = \frac{1}{2}\sqrt{10}$$

$$S_{\triangle EMF} = \frac{1}{2} ME \times MF = \frac{1}{2} \times \sqrt{10} \times \frac{1}{2}\sqrt{10} = \frac{10}{4} = \frac{5}{2} \sqrt{10}$$

$$ABE \Rightarrow AE^2 = AB^2 + BE^2 = 11^2 + 2^2 \rightarrow AE = \sqrt{121 + 4}$$

$$AEC \sim ACD \Rightarrow \frac{AE}{ED} = \frac{EC}{AB} \Rightarrow AE^2 = ED \times EC \rightarrow 11^2 + 2^2 = 10(10 + 2)$$

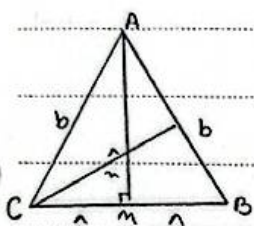
$$\Rightarrow x^2 - 10x + 11 = 0 \rightarrow x = \frac{10 \pm \sqrt{100 - 44}}{2} = \frac{10 \pm \sqrt{56}}{2}$$



$$\begin{aligned} ED &= \sqrt{1+14} = \sqrt{15} \\ EF^2 &= DF \times FC \rightarrow FC = 14 \\ BF^2 &= \epsilon \times 14 \rightarrow BF = \epsilon \\ BC^2 &= 1^2 + 14^2 = 197 \rightarrow BC = \sqrt{197} \end{aligned}$$

4

5

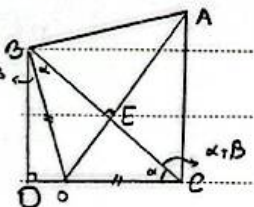


$$\begin{aligned} b^2 + b^2 &= 14^2 \rightarrow b^2 = 196 \rightarrow b = 14 \\ \sqrt{(14\sqrt{2})^2 + (14\sqrt{2})^2} &= \sqrt{14^2} = 14 \end{aligned}$$

صاف و اولی بر دقت نصف قدر

7

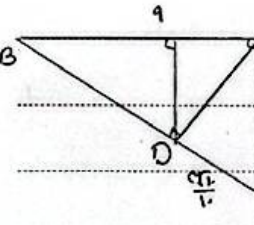
5



$$\begin{aligned} BC &= \sqrt{1+14} + 14\sqrt{2} = 2BE = 2EC \rightarrow BE = EC = \sqrt{2} \\ \frac{1}{\sqrt{2}} &= \frac{\epsilon}{AE} = \frac{14\sqrt{2}}{a} \Rightarrow AB = 14\sqrt{2} \\ S_{ABE} \cdot \frac{AE \times CE}{1} &= \frac{14\sqrt{2} \times \sqrt{2}}{1} = 21 \end{aligned}$$

1

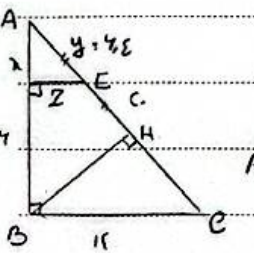
5



$$\begin{aligned} \sqrt{9+11} &= 2\sqrt{10} \\ \triangle DAC \sim \triangle ABC \rightarrow \frac{AC}{AB} = \frac{DA}{AC} = \frac{DC}{BC} \rightarrow \frac{1}{2\sqrt{10}} = \frac{AD}{1} = \frac{DC}{1} \rightarrow \frac{9\sqrt{10}}{10} \\ \triangle DEB \sim \triangle ABC \rightarrow \frac{ED}{AC} = \frac{EB}{BC} = \frac{BD}{AB} \rightarrow \frac{ED}{1} = \frac{EB}{1} = \frac{BD}{1} \rightarrow \frac{9\sqrt{10}}{10} - AD \\ \Rightarrow EB \times 2\sqrt{10} &= 1(2\sqrt{10} - \frac{9\sqrt{10}}{10}) \rightarrow EB \times 2\sqrt{10} = 1 \times \frac{11\sqrt{10}}{10} \rightarrow EB = 1 \end{aligned}$$

9

5



$$\begin{aligned} \triangle ABC \sim \triangle ADE \rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} \rightarrow \frac{2}{14-2} = \frac{y}{10} = \frac{z}{10} \\ \triangle ABC \sim \triangle BHC \rightarrow \frac{BH}{AB} = \frac{HC}{BC} = \frac{BC}{AC} \rightarrow \frac{BH}{14} = \frac{10-2y}{10} = \frac{10}{10} \\ \rightarrow 10(10-2y) &= 14 \times 10 \rightarrow 100 - 20y = 140 \rightarrow y = 4.5 \\ \frac{4.5}{10} &= \frac{z}{10} \rightarrow z = 4.5 \end{aligned}$$

10

5