

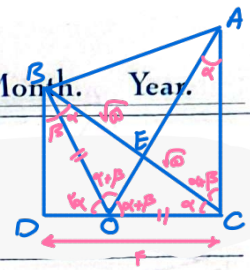
$$\angle A + \angle B = 90^\circ$$

Subject.

$$BD^2 + DC^2 = BC^2 \rightarrow BC = 2\sqrt{2} = BE = EC$$

$$\rightarrow BE = EC = \sqrt{2}$$

Day. Month. Year.



1A

$$\frac{r}{\sqrt{2}} = \frac{r}{AE} = \frac{r\sqrt{2}}{2} \rightarrow AE = r\sqrt{2}$$

$$S_{ABE} = \frac{1}{2} AE \times BE = 2$$

$$\triangle BOE \cong \triangle EOC \rightarrow BE = EC = \sqrt{2} \quad BA^2 = BE \times BC \rightarrow AB = \sqrt{10} \Rightarrow AE = \sqrt{2} \quad (1)$$

$$S_{ABE} = \sqrt{2} \times \sqrt{2} \times \frac{1}{2} = 1 \quad (1,0)$$

$$BA^2 = BC^2 + AC^2 \rightarrow AB = \sqrt{9} \quad 9 \times 10 = \sqrt{10} \times DC \rightarrow CD = \frac{9\sqrt{10}}{10} \quad (9)$$

$$9 = \frac{11}{10} + DA^2 \Rightarrow DA = \frac{4\sqrt{10}}{10} \rightarrow BD = \sqrt{90} - \frac{4\sqrt{10}}{10}$$

$$BD^2 = BE \times BC = (\sqrt{90} - \frac{4\sqrt{10}}{10})^2 \Rightarrow BE \times 9 = \frac{100}{10} \rightarrow BE = 11$$

$$AC^2 = 204 + 144 \rightarrow AC = 20 \quad AB^2 = BH^2 + AH^2 \quad BC^2 = HC^2 + BH^2 \quad (10)$$

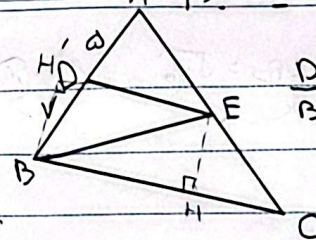
$$144 = HC^2 = BH^2$$

$$AB^2 = 144 - HC^2 + (20 - HC)^2 \Rightarrow 204 \geq 144 - HC^2 \rightarrow HC = 10$$

$$AE = \frac{20 - 10}{2} = 5$$

$$\triangle ABC \sim \triangle AEC \rightarrow \frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{5}{20} = \frac{DE}{10} \rightarrow DE = 2.5$$

MR



$$\frac{DE}{BC} = \frac{5}{14}$$

ارتفاعها برابر هستند

$$\frac{S_{\triangle BEC}}{S_{\triangle DEB}} = \frac{BC}{DE} = 1,4 \quad (1)$$

5

$$\triangle BDC \sim \triangle BDM \rightarrow DM \Rightarrow BM = MN = 3$$

$$\frac{BM}{MN} = \frac{BE}{EC} = 1 \Rightarrow \frac{BM}{BN} = \frac{ME}{NC} = \frac{1}{4} \rightarrow \frac{1}{4} = \frac{x}{4} \rightarrow x = 1$$

5

$$\begin{aligned} \angle FED &= \hat{B} - \alpha + \alpha = \hat{B} \\ \angle DEF &= \hat{A} - \alpha + \alpha = \hat{A} \end{aligned} \Rightarrow \triangle ABC \sim \triangle DEF \rightarrow \frac{1,4}{1} = \frac{4}{x} \rightarrow x = 2,8$$

$$\begin{aligned} \hat{E}_1 &= \hat{E}, \quad \hat{C}_1 = \hat{M} \\ \Rightarrow \triangle DCE &\sim \triangle MEB \rightarrow \frac{EM}{EC} = \frac{1}{4} \end{aligned} \quad (2)$$

$$\triangle MCB: CM^2 = MB^2 + BC^2 \rightarrow x^2 = 1 + 4 \rightarrow x = \sqrt{5}$$

$$\begin{aligned} \hat{C} &= \hat{M} \\ \hat{A} &= \hat{B} = 90^\circ \end{aligned} \Rightarrow \triangle FAM \sim \triangle CBM \rightarrow \frac{AM}{BC} = \frac{FM}{MC} \rightarrow FM = \frac{3\sqrt{5}}{4}$$

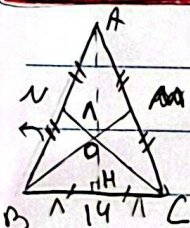
$$S_{FME} = \frac{1}{2} FM \times ME = \frac{1}{2} \times \frac{3\sqrt{5}}{4} \times \sqrt{5} = \frac{15}{8}$$

$$\begin{aligned} \hat{E}_1 &= \hat{E}, \quad \hat{A} = \hat{A} \\ \Rightarrow \triangle AED &\sim \triangle ACE \quad \frac{AE}{10+m} = \frac{AD}{AC} = \frac{10}{x} \rightarrow x^2 = 10(10+m) \end{aligned} \quad (3)$$

$$(m-1)(m-4) = 0 \quad m \rightarrow 4$$

$$\triangle DEC: EF^2 = DF \times FC \rightarrow FC = 14$$

$$\triangle ABC: BC^2 = CF \times AC \rightarrow BC = 1\sqrt{10}$$



$$1,4 = \frac{x}{4} \rightarrow x^2 = 1,4 \times 4 \rightarrow x = \sqrt{5,6} \rightarrow AM = MC = \sqrt{5,6}$$

$$\triangle AMB: MB^2 = (\sqrt{5,6})^2 + (1\sqrt{10})^2 = 14 \rightarrow MB = \sqrt{14}$$