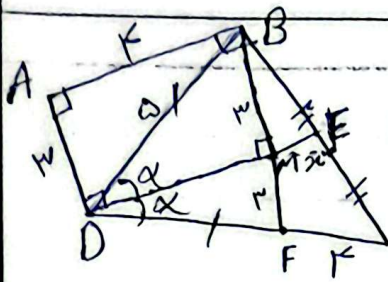


$$ADE \sim ABC \Rightarrow K = \frac{\Delta}{12}$$

$$\text{ارتفاع برابر} \rightarrow \frac{S_{BCE}}{S_{BDE}} = \frac{BC}{DE} = \frac{AB}{AD} = \frac{12}{\Delta} = \boxed{2,4}$$



$$BD = \sqrt{4^2 + 3^2} = \Delta \xrightarrow{\text{نقطه}} BD = DF = \Delta \rightarrow CF = 9 - \Delta = 12$$

$$ABMD \rightarrow \text{مستطیل} \Rightarrow BM = MF = 3, DM = 4$$

$$\frac{BM}{ABF} = \frac{BE}{BC} = \frac{1}{4} \Rightarrow ME \parallel FC$$

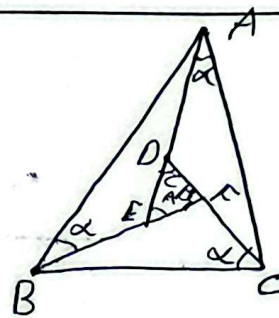
$$\Rightarrow \frac{x}{4} = \frac{3}{4} \Rightarrow x = 3$$

$$\hat{EFD} = \hat{B} - \alpha + \alpha = \hat{B}$$

$$\hat{DEF} = \hat{A} - \alpha + \alpha = \hat{A}$$

$$\hat{EDF} = \hat{C} - \alpha + \alpha = \hat{C}$$

$$\frac{12}{\Delta} = \frac{3}{x} \Rightarrow x = \frac{3\Delta}{12} = 9,4$$



$$\begin{cases} BMC \sim AMF \Rightarrow AF = \frac{3}{4} \textcircled{1} \\ BME \sim CDM \Rightarrow ME = \frac{1}{4} CE \textcircled{2} \end{cases} \quad MC = \sqrt{4^2 + 3^2} = 5\sqrt{2}$$

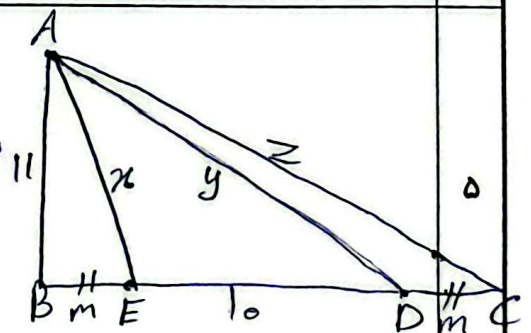
$$\textcircled{2} \Rightarrow ME = \sqrt{2}, CE = 4\sqrt{2}$$

$$MF = \sqrt{\left(\frac{3}{4}\right)^2 + 3^2} = \frac{3}{4}\sqrt{2} \Rightarrow S_{MEF} = \frac{1}{2} \left(\frac{3}{4}\sqrt{2}\right)(\sqrt{2}) = \boxed{3,75}$$

$$\frac{x}{10+m} = \frac{y}{z} = \frac{10}{z} \Rightarrow xz = 10(10+m)$$

$$\Rightarrow 11 + m^2 = 100 + 10m \Rightarrow m^2 - 10m + 11 = 0$$

$$(m-5)(m-2) = 0 \Rightarrow \underline{\underline{\frac{m=2}{m=5}}}$$



$$EF^2 = DF \times FC \Rightarrow 14 = 1 \times FC \Rightarrow FC = 14$$

$$BC^2 = CF \times AC \Rightarrow 14 \times 20 = BC^2 \Rightarrow BC = \boxed{1\sqrt{5}}$$

۶

میان دارد برای آن نصف و کراس است $\Rightarrow$ مثلث قائم الزاویه است. اندازه ساق مثلث x :
 $x^2 + x^2 = 14^2 \Rightarrow 2x^2 = 196 \Rightarrow x^2 = 98 \Rightarrow x = 1\sqrt{2}$

$$\text{میان نظیر ساق} = \sqrt{(1\sqrt{2})^2 + (4\sqrt{2})^2} = \sqrt{18} = \boxed{3\sqrt{2}}$$

۷

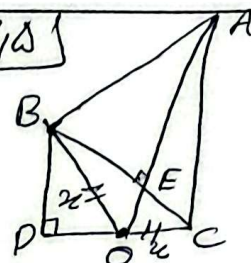
$$x^2 = 4 + 14 + x^2 - 1x \Rightarrow 1x = 20 \Rightarrow x = \frac{20}{1} = \boxed{20}$$

$$BC^2 = 4 + 36 = 40 \Rightarrow BC = \boxed{2\sqrt{10}}$$

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

$$OE^2 = \frac{20}{4} - 10 = \frac{10}{4} \Rightarrow OE = \frac{\sqrt{10}}{2}$$

$$OEC \sim ABE \quad \frac{\frac{\sqrt{10}}{2}}{\frac{1}{2}} = \frac{\sqrt{10}}{AE} \Rightarrow AE = \boxed{2\sqrt{10}} \quad S = \frac{1}{2} \times 2\sqrt{10} \times \sqrt{10} = \boxed{10}$$



۸

$$\tan \alpha = \frac{p}{q} = \frac{1}{\sqrt{10}} \rightarrow \cos \alpha = \frac{p}{\sqrt{10}}$$

$$BE = BC \times \frac{BD}{BC} \times \frac{BE}{BD} \Rightarrow 9 \times \frac{p}{\sqrt{10}} \times \frac{p}{\sqrt{10}} = \frac{11}{10} = \boxed{1,1}$$

۹

$$AC = \sqrt{204 + 144} = 20$$

$$BH \times AC = AB \times BC \rightarrow BH = \frac{14 \times 12}{20} = 8,4 \Rightarrow AH = \sqrt{14^2 - 8,4^2} = 11,2$$

$$AE = \frac{AH}{2} = 5,6 \rightarrow \triangle ADE \sim \triangle ABH \rightarrow \frac{DE}{BH} = \frac{AE}{AB} \rightarrow DE = \boxed{2,1}$$

۱۰