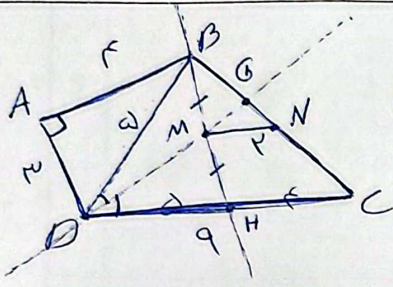


$$\frac{S_{BCE}}{S_{BDE}} = \frac{BC}{DE} = \frac{AB}{AD} = \frac{12}{5} = \boxed{2,4}$$

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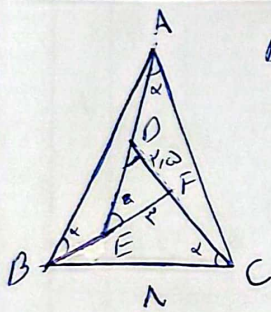


$\triangle BPM \sim \triangle DMH \Rightarrow DH = BM = 5 \rightarrow HC = 4$
 $\triangle BMC \sim \triangle MHC \Rightarrow BM = MH = 5$ (نسبت متساوی)

$$\frac{BM}{BH} = \frac{MN}{HC} = \frac{1}{2} \Rightarrow \frac{MN}{4} = \frac{1}{2} \Rightarrow \boxed{MN=2}$$

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$$\triangle DEF \sim \triangle ABC$$

$$\left. \begin{array}{l} \hat{F} = \hat{B} \\ \hat{D} = \hat{C} \\ \hat{E} = \hat{A} \end{array} \right\} \Rightarrow \frac{AB}{2} = \frac{1}{2,5} \rightarrow 2,5 AB = 2$$

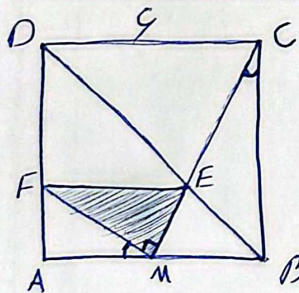
$$\frac{AB}{2} = \frac{1}{2,5} \rightarrow 2,5 AB = 2$$

$$\rightarrow 2,5 AB = 2$$

$$AB = \frac{2 \times 2}{2,5} = \boxed{1,6}$$

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$$MC^2 = 4^2 + 9 = 25 \Rightarrow MC = 5$$

$$\tan F = \frac{2}{AF} = \tan M = \frac{4}{5} \Rightarrow \frac{2}{AF} = \frac{4}{5} \Rightarrow AF = \frac{5}{2}$$

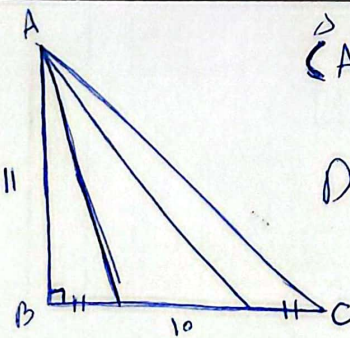
$$MF^2 = \frac{9}{4} + 9 = \frac{45}{4} \Rightarrow MF = \frac{3\sqrt{5}}{2}$$

$$\frac{MF}{ME} = \frac{2}{5} \Rightarrow ME = \frac{5 \times 3\sqrt{5}}{2 \times 2} = \frac{15\sqrt{5}}{4}$$

$$\text{مساحت مثلث} = \frac{MF \times ME}{2} = \frac{\frac{3\sqrt{5}}{2} \times \frac{15\sqrt{5}}{4}}{2} = \boxed{1,125}$$

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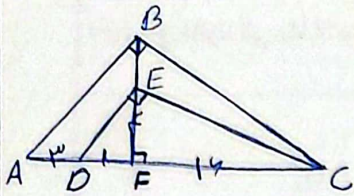
$$\triangle ADE \sim \triangle ABC \Rightarrow \frac{DE}{AC} = \frac{AD}{AB} \Rightarrow \frac{10}{AC} = \frac{10}{10} \Rightarrow AC = 10$$

$$DC^2 + 10^2 = 10^2 + 10^2 \Rightarrow DC = 10$$

$$CD^2 - 10DC + 10^2 = 0 \Rightarrow DC = 10$$

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

$$FC = 14$$

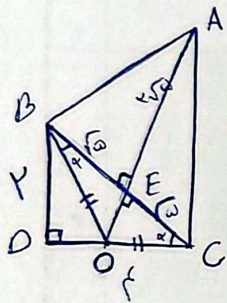
$$BC^2 = CF \times AC = 14 \times 20 \Rightarrow BC = 1\sqrt{14}$$

* میانه دارد بر آن نسبت داده (وتر) است.
 پس مثلث قائم الزامی است.

$$x^2 + x^2 = 14 \Rightarrow 2x^2 = 14 \Rightarrow x = 1\sqrt{2}$$

میانه نظیر هرسان

$$= \sqrt{(1\sqrt{2})^2 + (1\sqrt{2})^2} = \sqrt{2+2} = \sqrt{4} = 2$$

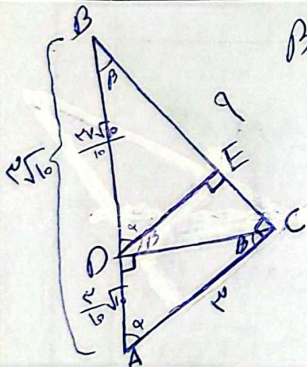


$$BC = \sqrt{2^2 + 2^2} = 2\sqrt{2} = 2DE = 2EC$$

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

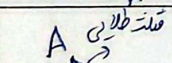
$$AEC \sim BCD \Rightarrow \frac{2}{\sqrt{2}} = \frac{2}{AE} = \frac{2\sqrt{2}}{2} \Rightarrow$$

$$AE = \sqrt{2} \Rightarrow S_{ABE} = \frac{AE \times EC}{2} = \frac{(2\sqrt{2})(\sqrt{2})}{2} = 2$$



$$BD = \frac{9 \times 9}{2\sqrt{10}} = \frac{27}{10} \sqrt{10} \Rightarrow BD = \frac{27}{10} \sqrt{10} \times 9$$

$$\frac{27 \times 9}{20} = 1,1$$



$$ADE \sim ABH \rightarrow \frac{DE}{BH} = \frac{AE}{14}$$

$$BH \Rightarrow 14 \times 12 = BH \times 20 \Rightarrow BH = 9,6$$

$$14^2 = AH \times 20 \Rightarrow \frac{AH}{2} = AE = 4,9$$

$$DE = \frac{9,6 \times 4,9}{14} = 2,84$$