



$$BEC - B_2 + C + E_3 \quad 180 \rightarrow 180 - C - E_3, B_2$$

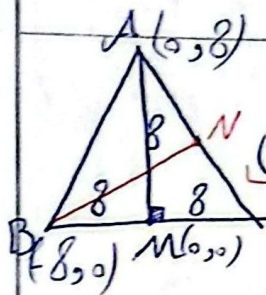
$$\frac{SBCE}{SBDE} = \frac{\frac{1}{2} \times \sin B_2 \times BE \times BC}{\frac{1}{2} \times \sin E_2 \times BE \times DE} = \frac{12}{5} = 2\frac{2}{5} \checkmark$$

$$\frac{C(9\cos\alpha - 9\sin\alpha)}{\sqrt{(516-4)^2 + (-1220)^2}} = (7/2, -5/4) \cdot \frac{1}{\sqrt{2}} (516, -112) = \frac{C}{\sqrt{2}} (516, -112)$$

$$\begin{aligned} \triangle BMC \sim \triangle MF \implies \frac{A \cdot B}{M_3 \cdot C_2} &\rightarrow \frac{AF}{MB} \cdot \frac{AM}{BC} \rightarrow AF \cdot \frac{3}{2} \\ \triangle MBE \sim \triangle CDE \implies \frac{M_1 \cdot C_1}{E_1 \cdot E_2} &\rightarrow \frac{MB}{CD} \cdot \frac{ME}{CE} = \frac{ME}{CE} \cdot \frac{1}{2} \\ &\rightarrow CM \cdot \sqrt{36+9} \cdot \sqrt{45 \div 3} \cdot ME \cdot \sqrt{5} \\ &\rightarrow MF \cdot \sqrt{\frac{9}{4}+9} = \frac{3}{2} \sqrt{5} \quad \frac{1}{2} \cdot \sqrt{5} \cdot \frac{3}{2} \sqrt{5} = 3/75 \end{aligned}$$

$\triangle E, \mathcal{A}, BE, DC, m \rightarrow \triangle EID \sim \triangle CEF$ $\therefore \frac{C, E, D}{E, E}$
 $\frac{10}{\mathcal{A}} = \frac{\mathcal{A}}{10+m} \rightarrow \mathcal{A}^2, 100, 10m \rightarrow \mathcal{A}^2, 121, m^2$
 $m^2 + 121 = 100 + 10m \rightarrow m^2 - 10m + 21 = 0 \rightarrow \boxed{m = 3, 7} \checkmark$

$$EF^2 = FD \cdot FC = FC \cdot 16 = BF^2 \cdot \frac{AF}{FC} = BF \cdot 8 \\ \rightarrow BC = \sqrt{16^2 + 64} = \sqrt{320} = 8\sqrt{5} \quad \checkmark$$



$$AC^2 = AN^2 + NC^2 \quad AC = \sqrt{128} = 8\sqrt{2} \\ \text{میان خطها در نقطه N} \quad \text{از آنجا که} \quad BN = 8 \\ N(4,4) \quad \text{وسط } A, C \\ \sqrt{(-8-4)^2 + (4)^2} = \sqrt{160} = 4\sqrt{10} \quad \checkmark$$

$$CD \cdot AB = BC \cdot AC \rightarrow AB = \sqrt{81+9} = 3\sqrt{10} \rightarrow DC = \frac{27}{3\sqrt{10}} \\ \rightarrow DC = \frac{9\sqrt{10}}{10} \\ \frac{3}{3\sqrt{10}} = \frac{AD}{\frac{9\sqrt{10}}{10}} \rightarrow AD = \frac{3\sqrt{10}}{10} \rightarrow BD = 3\sqrt{10} - \frac{3\sqrt{10}}{10} = \frac{27\sqrt{10}}{10} \\ \frac{27\sqrt{10}}{10} = \frac{BE}{9} = \frac{9}{10} \rightarrow BE = \frac{81}{10} \quad \checkmark$$

$$BO \perp OC \rightarrow 4 + (4-x)^2 = x^2 \rightarrow x = 2/5 \quad DO = 1/5 \\ BE = EC = \sqrt{5} \quad \text{زیرا در مثل متساوی الساقین ارتفاع میانم تر است} \\ AOC \sim OEC \quad \frac{EO}{AO} = \frac{OC}{AC} = \frac{EC}{OC} \rightarrow EO = \frac{\sqrt{5}}{2} \\ AO = \frac{5\sqrt{5}}{2} \rightarrow AE = 2\sqrt{5} \rightarrow \frac{AE \cdot EB}{2} = \frac{2\sqrt{5} \cdot \sqrt{5}}{2} = 5 \quad \checkmark$$

$$BHC \sim ABC \quad \frac{CH}{BC} = \frac{CH}{12} = \frac{12}{20} \rightarrow CH = 7/2 \rightarrow AE = EH = 6/4 \\ ADE \sim ABC \quad \frac{DE}{BC} = \frac{DE}{12} = \frac{6/4}{20} \rightarrow DE = 3/8 \quad \checkmark$$