

$$\frac{S_{BCE}}{S_{ADE}} = \frac{BC \times h}{DE \times h} = \frac{AB}{AD} = \frac{15}{0} = 5 \quad (2)$$

$$BD = \sqrt{3^2 + 4^2} = 5$$

$$\hat{M} = \hat{A} = 90^\circ \Rightarrow AD = BM = 3$$

$$AB \parallel DM \quad AD \parallel BM \Rightarrow \hat{ABD} = \hat{BDM} \Rightarrow AB = DM = 4$$

$$\left. \begin{array}{l} BDC = 2BDM \\ BDM = MDC = 2BDM \end{array} \right\} BDM = MDC, BDC \Rightarrow BDM = MDC$$

$$\left. \begin{array}{l} M = M \\ DM = DM \end{array} \right\} \triangle BDM \cong \triangle MDC$$

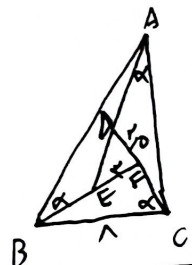
$$DF = 0 \quad FM = 3$$

$$FC = 4 \quad EF = 0/0$$

$$EN \parallel BD \Rightarrow \frac{CN}{CB} = \frac{CE}{CD} = \frac{EN}{BD}$$

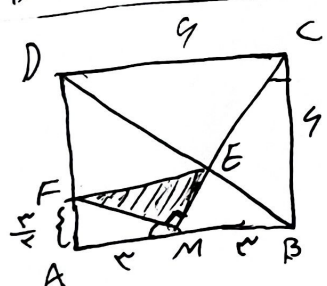
$$MN = EN - EM = 2 \quad \checkmark$$

$$\frac{EF}{FD} = \frac{EM}{BD} \Rightarrow EM = 0/0$$



$$\triangle ABC \sim \triangle DEF \Rightarrow \frac{AB}{EF} = \frac{BC}{DF} \Rightarrow \frac{AB}{4} = \frac{1}{0/0}$$

$$\Rightarrow AB = 9,4 \quad \checkmark$$



$$\triangle BME \sim \triangle CDM \Rightarrow ME = \frac{CE}{2}$$

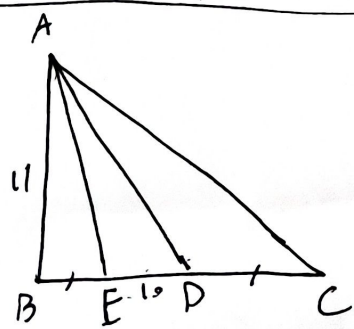
$$\triangle BMC \sim \triangle AMF \Rightarrow AF = \frac{2}{2}$$

$$M = \sqrt{3^2 + 4^2} = 5$$

$$MF = \sqrt{\left(\frac{2}{2}\right)^2 + 3^2} = \frac{5}{2}$$

$$ME = \frac{CE}{2} \Rightarrow ME = 5, CE = 10$$

$$S_{MEF} = \frac{\left(\frac{5}{2} \cdot 5\right)(5)}{2} = \frac{62,5}{2} \quad \checkmark$$



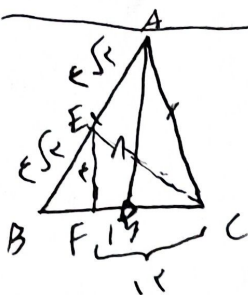
$$\frac{AE}{BE+10} = \frac{AD}{AC} = \frac{ED}{AE}$$

$$AE^2 = ED \times BD = 10 \times (10 + BD) \Rightarrow BD^2 + 121 = 10AE^2 + 100$$

$$BD^2 - 10BD + 121 = 0 \Rightarrow BD = \frac{10 \pm \sqrt{100 - 484}}{2} \quad \checkmark$$

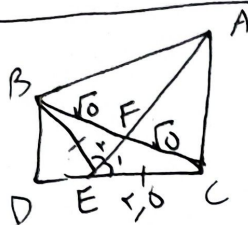
$$\triangle DEC: EF^2 = DF \times FC \Rightarrow FC = 14$$

$$\triangle ABC: BC^2 = CF \times AC = 14 \times 20 = 280 \Rightarrow \boxed{BC = 14\sqrt{10}}$$



$$AD \parallel EF \Rightarrow \frac{EF}{AD} = \frac{EB}{AB} = \frac{FB}{BD} \Rightarrow BF = EF = F$$

$$CE = \sqrt{CF^2 + EF^2} = \sqrt{14^2 + 14^2} = \boxed{14\sqrt{2}}$$



$$EC \perp EB \Rightarrow \angle E = 90^\circ \quad F-DE = \sqrt{EF^2 + DE^2}$$

$$BC = \sqrt{14^2 + 14^2} = 14\sqrt{2}$$

$$\left. \begin{matrix} \angle B = \angle C \\ \angle E = \angle F \end{matrix} \right\} \Rightarrow E_1 = E_2 \Rightarrow BF = CF$$

$$BF + FC = BC \Rightarrow BC = 2BF \Rightarrow BF = FC = 7\sqrt{2}$$

$$AB = \sqrt{AC^2 + BC^2} = 14\sqrt{10}$$

$$AC^2 = AD \times AB \Rightarrow 9 = n \times 14\sqrt{10} \Rightarrow n = \frac{9}{14\sqrt{10}} \Rightarrow BD = \frac{9\sqrt{10}}{14}$$

$$\frac{BD}{AB} = \frac{BE}{BC} \rightarrow \frac{\frac{9\sqrt{10}}{14}}{14\sqrt{10}} = \frac{BE}{14\sqrt{10}} \Rightarrow \boxed{BE = \frac{9}{14}}$$

$$\left. \begin{matrix} \angle A = \angle A \\ \angle E = \angle C \\ \angle B = \angle D \end{matrix} \right\} \Rightarrow \triangle ADE \sim \triangle ABC$$

$$\frac{DE}{BC} = \frac{AE}{AC} \Rightarrow \frac{DE}{14} = \frac{9}{20} \Rightarrow DE = \frac{9}{14}$$

