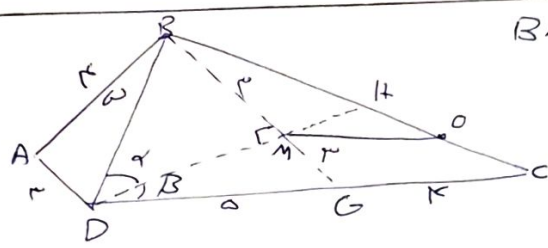


$$\frac{DE}{BC} = \frac{12}{17}$$

$$\frac{S_{\triangle BEC}}{S_{\triangle DEB}} = \frac{BC}{DE} = \frac{17}{12} = 4,16$$

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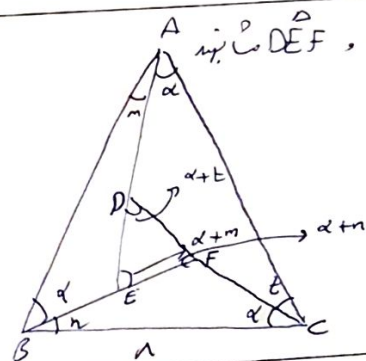


$$BMO \sim BGC$$

$$\frac{BM}{BG} = \frac{1}{7} = \frac{BO}{BC} \Rightarrow \frac{MO}{CG} = \frac{1}{7}$$

$$MO = 1$$

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$$\begin{cases} \hat{F} = \hat{B} \\ \hat{D} = \hat{C} \\ \hat{E} = \hat{A} \end{cases}$$

$$\Rightarrow \frac{AB}{c} = \frac{1}{7,5} \Rightarrow 7,5AB = 45$$

$$AB = \frac{45}{7,5} = 6$$

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$$\begin{cases} B\hat{M}C \sim A\hat{M}F \Rightarrow AF = \frac{1}{7} \\ B\hat{M}E \sim C\hat{D}M \Rightarrow ME = \frac{1}{7}GE \end{cases}$$

$$MC = \sqrt{4^2 + 1^2} = \sqrt{17}$$

$$ME = \frac{1}{7}CE \Rightarrow \begin{cases} ME = \sqrt{2} \\ CE = 7\sqrt{2} \end{cases}$$

$$MF = \sqrt{\left(\frac{1}{7}\right)^2 + 9} = \frac{1}{7}\sqrt{8}$$

$$S_{MEF} = \frac{1}{2} \left(\frac{1}{7}\sqrt{8}\right)(\sqrt{8}) = \frac{4}{7}$$

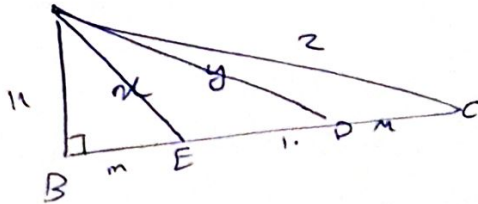
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$$\frac{x}{1+m} = \frac{y}{2} = \frac{1}{x} \Rightarrow x^2 = 1 \cdot (1+m) \Rightarrow 1 + m^2 = 1 + 0 + 1 + m \Rightarrow m^2 - 1 - m + 1 = 0$$

$$\Rightarrow (m-1)(m-2) = 0 \Rightarrow m = 1 \text{ or } m = 2$$

$$\Rightarrow m < 2$$

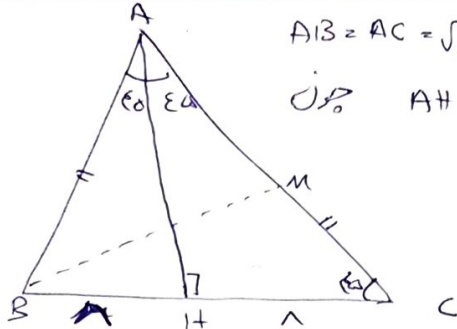
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$$\triangle DEC \sim \triangle EFC \Rightarrow EF^2 = DF \times FC = 4^2 \times 1 \Rightarrow FC = 14$$

$$\triangle ABC \sim \triangle BFC \Rightarrow BF^2 = AF \times FC \rightarrow BF^2 = 6 \times 14 = 42 \rightarrow BF = \sqrt{42}$$

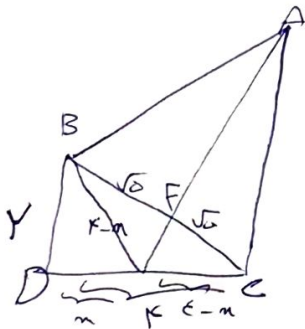
$$\triangle BFC \sim \triangle BCF \Rightarrow BC^2 = BF^2 + FC^2 \Rightarrow BC^2 = 42 + 14^2 = 196 \Rightarrow BC = 14$$



$$AB = AC = \sqrt{(AH)^2 + (HC)^2} = \sqrt{1^2 + 14^2} = \sqrt{196} = 14$$

$$\text{Since } AH = HC \rightarrow \triangle AHC \cong \triangle AHB \Rightarrow \angle A_1 = \angle C = 90^\circ$$

$$BM = \sqrt{AB^2 + AM^2} = \sqrt{14^2 + 1^2} = \sqrt{197} \approx 14.035$$

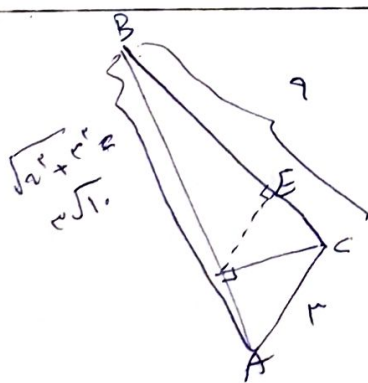


$$(x-m)^2 = x^2 + m^2 \Rightarrow x^2 + 6 = x^2 - 14m + 14 \Rightarrow 14m = 8 \Rightarrow m = \frac{4}{7}$$

$$\Rightarrow BM = CM = \frac{1}{2} \times \frac{4}{7} = \frac{2}{7}, BC = \sqrt{6^2 + 2^2} = 2\sqrt{10}$$

$$EM = \sqrt{(\frac{2}{7})^2 + (2\sqrt{10})^2} = \sqrt{\frac{4}{49} + 40} = \sqrt{\frac{1964}{49}} = \frac{\sqrt{1964}}{7}$$

$$EC^2 = EM \times AE \Rightarrow \Delta = \frac{\sqrt{1964}}{7} \times AE \Rightarrow S_{ABE} = \frac{2\sqrt{10} \times \Delta}{2} = \frac{2\sqrt{10} \times \frac{\sqrt{1964}}{7} \times AE}{2}$$



$$BC^2 = BD \times AB$$

$$10 = BD \times \sqrt{10} \Rightarrow BD = \frac{10}{\sqrt{10}} = \sqrt{10}$$

$$BD^2 = BE \times BC = \frac{10}{10} \Rightarrow BE = 1$$

$$BE = \frac{10 \times 10}{10 \times 10} = \frac{10}{10} = 1$$

$$\triangle ABM \rightarrow BE \times AB = AB \times AF$$

$$8 = \frac{BM \times 10}{10} = \frac{14 \times 10}{10} \rightarrow BH = 9.4$$

$$14^2 = (9.4)^2 + (AH)^2 \rightarrow AE = AH \rightarrow AE = 4.6$$

$$DE = \frac{9.4 \times 4.6}{14} = 3.1 \times 1.4 = \boxed{4.34}$$