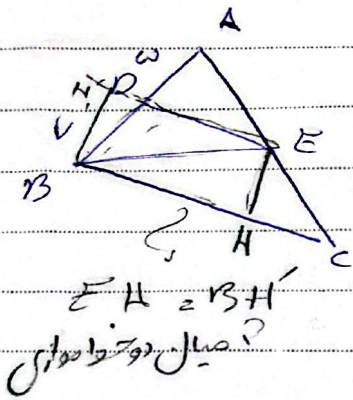


سوال ۱:

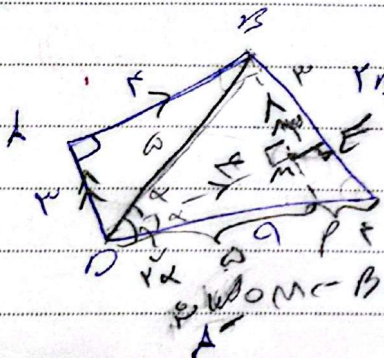


$$BC \parallel DE \Rightarrow \frac{AD}{AB} = \frac{DE}{BC}$$

$$\frac{S_{BDE}}{S_{BCE}} = ? \Rightarrow \frac{DE}{BC} = \frac{12}{12} = 1$$

$$\frac{1}{2} \times EH \times 12 = \frac{1}{2} \times BH \times 12 \Rightarrow EH = BH$$

سوال ۲:

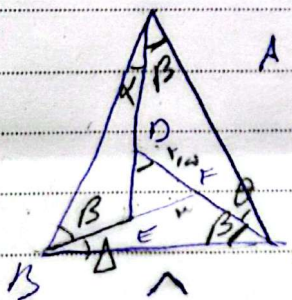


$$\angle BDM = \angle BDC$$

$$\frac{BM}{MD} = \frac{BE}{EC} = 1 \Rightarrow ME = EC$$

$$\frac{BM}{BD} = \frac{ME}{BC} \Rightarrow M = 2$$

سوال ۳:



$$\angle ABF = \angle CEF = \angle BCD$$

$$EF = 2, DF = 1$$

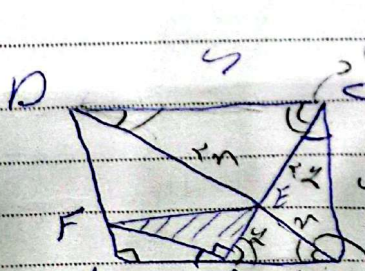
$$\angle D = \angle B + \angle C$$

$$\angle F = \angle B + \angle C$$

$$\angle E = \angle B + \angle C$$

$$\triangle DFE \sim \triangle ABC$$

سوال ۴:



$$M = \sqrt{12} \Rightarrow M = 2\sqrt{3}$$

$$\angle BCE = \angle AMF$$

$$MB \parallel DC \Rightarrow \angle MEB \sim \angle CED$$

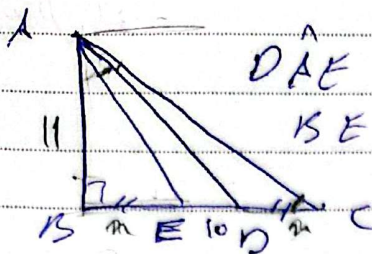
$$\frac{ME}{CE} = \frac{MB}{ED} = \frac{EB}{ED} = 1$$

$$M = 2\sqrt{3} \Rightarrow M = 2\sqrt{3}$$

$$MCB \sim FMA \Rightarrow \frac{AC}{FM} = \frac{MB}{FA} = \frac{CB}{MA} = 2$$

$$S_{FME} \rightarrow \frac{1}{2} \times \sqrt{12} \times \frac{2\sqrt{3}}{2} = \frac{12}{2} = 6$$

$$FM = \frac{2\sqrt{3}}{2}$$



$$\hat{DAE} = \hat{ACD} \quad \hat{CAE} = \hat{ADE}$$

$$BE = DC \quad \frac{CA}{AD} = \frac{CE}{AE} = \frac{AE}{OE} \rightarrow AE^2 = CE \cdot DE$$

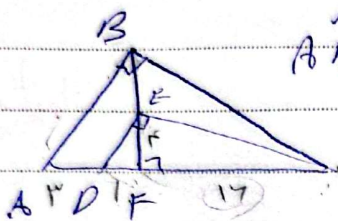
$$AE^2 = m^2 + 121 \rightarrow m^2 + 121 = (10 + m) \cdot 10$$

$$121 + m^2 = 100 + 10m$$

$$m^2 - 10m + 21 = 0$$

$$(m - 7)(m - 3) = 0 \quad m = 7 \quad m = 3$$

سوال ٦:



$$\hat{ABC} = \hat{CED} = 90^\circ$$

$$AD = 17 \quad EF = 7$$

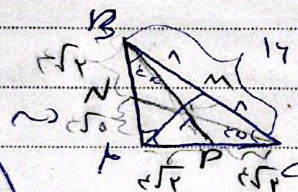
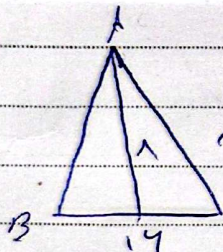
$$DF = 1 \quad BC = ?$$

$$ED = \sqrt{14 \cdot 1} = \sqrt{14}$$

$$DE^2 = DF \cdot DC \rightarrow 14 = (1 + FC) \rightarrow FC = 13$$

$$AB^2 = EF \cdot AC \rightarrow \sqrt{14} = AB$$

$$AC = AB + BC \rightarrow \sqrt{14} = 10 + BC \rightarrow BC = \sqrt{14} - 10$$



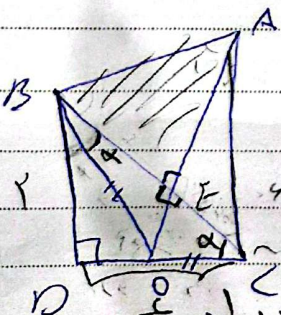
$$m^2 + n^2 = 14 \cdot 4$$

$$m^2 = 14 \rightarrow m = \sqrt{14}$$

$$BA^2 = (\sqrt{14})^2 + (\sqrt{14})^2 = 28$$

$$14 + 14 = 28 \rightarrow BD = \sqrt{14} = \sqrt{10}$$

$$CA^2 = (\sqrt{14})^2 + (\sqrt{14})^2 = 28 \rightarrow NC = \sqrt{10}$$



$$BD = 1 \quad CD = 1$$

$$\hat{ACD} = 90^\circ \quad BD^2 + DC^2 = BC^2 \rightarrow BC = \sqrt{20} = 2\sqrt{5}$$

$$\triangle AEB = ? \quad \triangle AEB \cong \triangle CED \rightarrow CE = BE = \frac{BC}{2} = \sqrt{5}$$

$$BA^2 = BE \cdot BC \rightarrow BA^2 = \sqrt{5} \cdot 2\sqrt{5} \rightarrow BA = 10 \quad BA = \sqrt{10}$$

$$BA^2 = BE^2 + AE^2 \rightarrow 10 = 5 + AE^2 \rightarrow AE = \sqrt{5}$$

$$S_{AEB} = \frac{1}{2} \times \sqrt{5} \times \sqrt{5} = \frac{5}{2} = 2.5$$

$$14 = 1 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10$$

Arman

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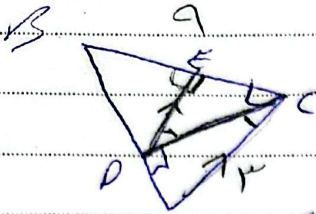
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$$C=9, CD^2 = CE \times BC$$

$$AC=12 \Rightarrow \frac{12^2}{10} \times \frac{1}{9} = CE = \frac{9}{10}$$

$$BC=9$$

$$BC - CE = BE \Rightarrow$$

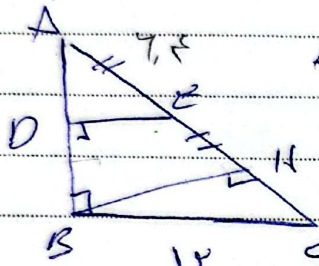
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$$9 - \frac{9}{10} = \frac{81}{10}$$

$$AB^2 = 9^2 + 9^2 = 162$$

$$AB = \sqrt{162} = 9\sqrt{2}$$

$$CA^2 = AD \times AB \Rightarrow 9 = AD \times 9\sqrt{2} \Rightarrow AD = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$



$$AB=14$$

$$AC^2 = 14^2 + 12^2 \Rightarrow AC = 20$$

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$$AB^2 = AH^2 + BH^2$$

$$BC^2 = HC^2 + BH^2 \Rightarrow 144 - HC^2 = BH^2$$

$$AB^2 = (20 - HC)^2 + 144 - HC^2$$

$$196 = 400 - 40HC + HC^2 - HC^2$$

$$AE = 20 - 11.2 = 8.8$$

$$11.2 = 5HC$$

$$\Rightarrow HC = 2.24$$

$$\frac{DE}{BC} = \frac{AD}{AB} = \frac{AE}{AC} \Rightarrow DE = 2.24$$