

$$BC \parallel DE \Rightarrow \frac{DE}{BC} = \frac{a}{12} \quad (1)$$

ارتفاع های مثلث ها برابرند

$$\frac{S_{\triangle BCE}}{S_{\triangle DEB}} = \frac{BC}{DE} = \frac{12}{a} = \frac{2}{1} \Rightarrow \frac{2}{1}$$

ABMD مستطین

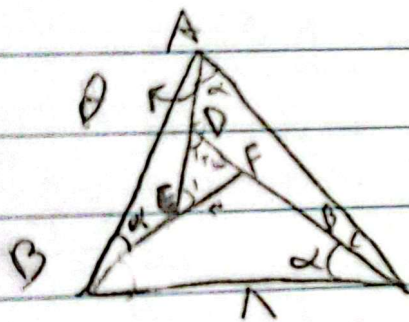
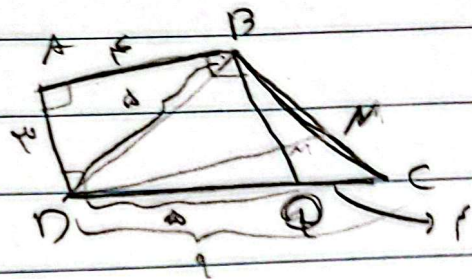
$$AD = 2 \quad BA = 2 \quad BD = a$$

$$BD^2 = 2^2 + 2^2 \Rightarrow BD = 2\sqrt{2}$$

$$\triangle BDQ \rightarrow DQ = a$$

$$MN = DQ \Rightarrow MN = 2$$

$$m\angle B = m\angle C = 30^\circ$$



$$\angle ADF = \angle CAG = \angle BCD$$

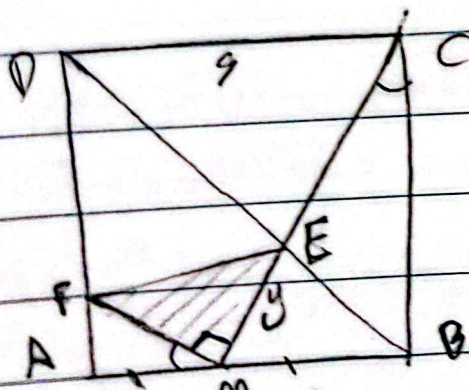
$$DF = 2/3 a \quad AB = ?$$

$$\angle E_1 = \alpha + \beta = \hat{A}$$

$$\angle D_1 = \alpha + \beta = \hat{C}$$

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

$$(I) \Rightarrow \frac{DF}{BC} = \frac{EF}{AB} \Rightarrow \frac{2/3 a}{a} = \frac{r}{AB} \Rightarrow AB = \frac{12r}{2/3 a} = 9/5$$



$$\angle BCE = \angle AMF$$

$$m\angle C = m\angle A + m\angle B \Rightarrow 30^\circ + 30^\circ = 60^\circ \Rightarrow m\angle C = 60^\circ$$

$$\tan F = \frac{r}{a} = \tan M = \frac{BC}{a} = 2 \Rightarrow AF = \frac{r}{2}$$

$$FM^2 = AF^2 + AM^2 \Rightarrow MF = \frac{r\sqrt{5}}{2}$$

$$DEC, m\angle B = 30^\circ \Rightarrow \frac{r}{a} = \frac{y}{a} \Rightarrow y = \sqrt{a}$$

$$S_{\triangle FBM} = \frac{ME \cdot MF}{2} = \frac{r\sqrt{5} \cdot \sqrt{a}}{2} = \frac{1a}{2} = 1/2 a$$

$$\left. \begin{array}{l} A_1 \hat{=} C_1 \\ E_1 \hat{=} E_1 \end{array} \right\} \Delta APB \sim \Delta CEB \rightarrow \frac{AP}{AC} = \frac{BE}{CB} = \frac{PB}{CE} \rightarrow AB^2 = BE \times CB \quad (4)$$

$$AB^2 = 10(10 + BC) = 100 + 10BC$$

$$AB^2 = AP^2 + PB^2 \rightarrow 100 + 10CB = 1 + 1 + PE^2 \xrightarrow{CE=PE} 2 + 10 = 12$$

$$2^2 - 12 + 10 = 0 \rightarrow 2^2 - 12 + 10 = 0 \rightarrow (2 - 4)(2 - 6) = 0$$

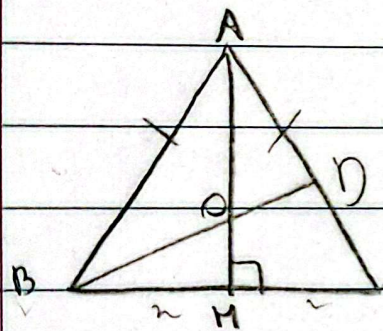
$$\left\{ \begin{array}{l} 2 = 4 \\ 2 = 6 \end{array} \right\}$$

(5)

BC = ?

$$DFC \rightarrow BF^2 = DF \times FC \rightarrow EF^2 = FC \times 1 \rightarrow FC = 19$$

$$\Delta BCF \rightarrow FC \times AC = 19(19 + 1) = 381 \rightarrow BC = 1\sqrt{19}$$



$$AH = 5$$

$$HO = 2 \rightarrow 5 \times 2 = 10 \Rightarrow H = \frac{1}{2}$$

$$MO = \frac{1}{2}$$

$$BM = 1 + \frac{1}{2} = \frac{3}{2} = \frac{3\sqrt{10}}{2} \quad BD$$

$$\frac{BD}{BM} = 2 = \frac{BD}{\frac{3\sqrt{10}}{2}} \Rightarrow BD = 3\sqrt{10}$$

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$$\left. \begin{array}{l} OB \hat{=} OE \\ OB \hat{=} OC \\ O_1 \hat{=} O_2 \end{array} \right\}$$

$$\Delta OPB \sim \Delta OCE \rightarrow BE = EC$$

$$\text{في المثلث } BC = \sqrt{2+12} = \sqrt{14} = 2\sqrt{2}$$

$$\rightarrow BC = 2\sqrt{2} \rightarrow EC = \sqrt{2}$$

$$\left. \begin{array}{l} \hat{D} \hat{=} \hat{E} \hat{=} 90^\circ \\ \hat{B}_1 \hat{=} \hat{C}_1 \end{array} \right\} \rightarrow \Delta BCD \sim \Delta EOC \rightarrow \frac{2}{\sqrt{2}} = \frac{r}{AB} = \frac{2\sqrt{2}}{2} \rightarrow AB = 2$$

$$S_{ABE} = \frac{AB \times BE}{2} = \frac{2 \times \sqrt{2}}{2} = \sqrt{2}$$

$$D_1 = 2$$

$$D_1 + C_1 = 1 \text{ m}$$

$$CD^2 + BD^2 = BC^2$$

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$$C_1 = y$$

$$DC^2 = 1 - \frac{y^2}{1} = \frac{1}{1} \Rightarrow DC = \frac{1}{\sqrt{1}}$$

$$\rightarrow BA = \sqrt{2}$$

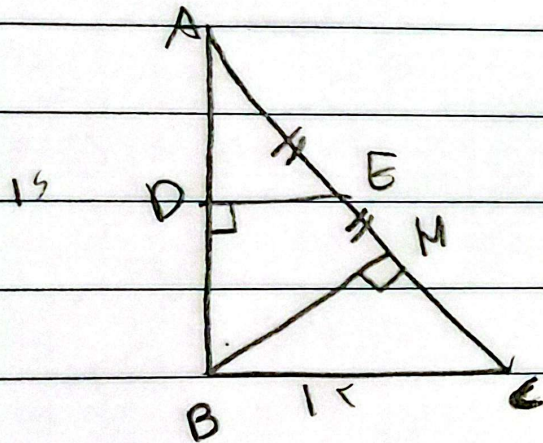
$$BC^2 = BD \cdot BA \rightarrow BD = \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$

$$DE^2 + EC^2 = DC^2$$

$$\rightarrow DC^2 = CB^2 \times CB^2 \rightarrow \frac{1}{1} = CE^2 \times 1$$

$$CE^2 = \frac{1}{1} = 1 \rightarrow CE = 1$$

$$EB = BC - CE = 1/1$$



$$\triangle ABM \rightarrow DE \times AB = BM \times AE$$

(10)

$$S = \frac{BM \times 1.5}{1} = \frac{1.5 \times 1.5}{1}$$

$$\Rightarrow BM = \frac{1.5}{1} = 1.5$$

$$1.5^2 = 2.0^2 + (AM)^2 \rightarrow AE = AM \rightarrow AE = 1.5$$

$$DE = \frac{1.5 \times 1.5}{1.5} = 1.5$$