نام و نام خانوادگی ...امیرمحمد مجتبائی...... پاسخنامه تشریحی تکلیف شماره ..۲۲.. کلاس ..یازدهم تجربی B.......

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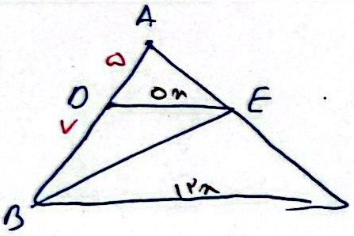

$\frac{S_{BCE}}{S_{BDE}} = \frac{\frac{1}{2} \times BC \times h}{\frac{1}{2} \times DE \times h} = \frac{12x}{5x} = \boxed{2.4}$

$DE \parallel BC \Rightarrow \frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{5}{12} = \frac{DE}{BC} = \frac{5x}{12x}$

$\overset{\Delta}{BCE}$, BDE : مثلث های هم ارتفاع هستند

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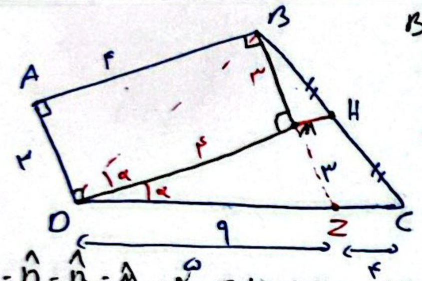

$B\hat{D}M = M\hat{D}Z$, $DM = DM$ } ض ز ز داده : $B\hat{D}M \cong DMZ$

دو مثلث با هم هم نهشت اند پس :

$DZ = DB$; $BD^2 = BM^2 + DM^2$, $BM = MZ = 3$

$DM = \sqrt{9+16} \Rightarrow DM = 5 = DZ$

$AD \parallel BM = h$

$\hat{A} = \hat{D} = \hat{B} = \hat{M} = 90^\circ$ مستطیل است $ABDM$

$\frac{BM}{MZ} = \frac{BH}{HC} = 1 \Rightarrow MH \parallel ZC \Rightarrow \frac{BM}{BZ} = \frac{MH}{ZC}$

فرض $BH = HC$

$\Rightarrow \frac{3}{6} = \frac{MH}{4} \Rightarrow \boxed{MH = 2}$

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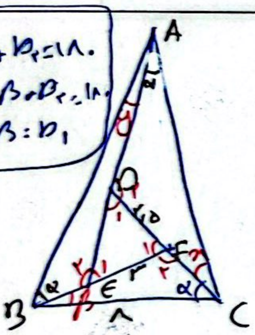

$D_1 + D_2 = 180$

$\alpha + \beta + D_2 = 180$

$\alpha + \beta = D_1$

$F\hat{B}C = \beta$, $B\hat{A}E = y$, $A\hat{C}D = x$ $\Rightarrow D_1 = \alpha + x$ زاویه خارجی

$E_1 = \alpha + y$, $F_1 = \alpha + \beta$

$\hat{A} = \alpha + y$, $\hat{B} = \alpha + \beta$, $\hat{C} = \alpha + x$

$E_1 = \alpha + y$, $F_1 = \alpha + \beta$, $D_1 = \alpha + x$ $\Rightarrow \hat{A} = E_1$, $\hat{B} = F_1$, $\hat{C} = D_1$ } $\overset{\Delta}{D_1E_1F_1} \sim ABC$

$\frac{DF}{BC} = \frac{EF}{AB} = \frac{DE}{AC} \Rightarrow \frac{2.5}{8} = \frac{3}{AB}$

$\boxed{AB = 9.6}$

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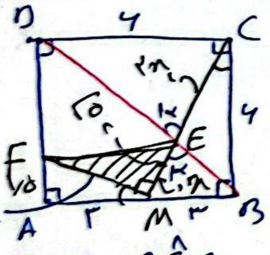

$B\hat{C}E = A\hat{M}F$, $\hat{A} = \hat{B} = 90$ } $F\hat{A}M \sim MBC$; $\frac{FA}{MB} = \frac{AM}{BC}$

$CM = \sqrt{36+9}$

$\frac{FA}{3} = \frac{3}{6} \Rightarrow FA = 1.5$; $CM = 3\sqrt{5} \Rightarrow x + 2x = 3\sqrt{5} \Rightarrow x = \sqrt{5}$

$FM = \sqrt{9 + (1.5)^2} = \sqrt{9 + \frac{9}{4}} = \frac{\sqrt{45}}{2} = \frac{3\sqrt{5}}{2}$

$\boxed{S_{F\hat{M}E} = \frac{1}{2} \times \frac{3\sqrt{5}}{2} \times \sqrt{5} = 3.75}$

$\frac{DC}{2}$

$D\hat{E}C = M\hat{E}B$, $B\hat{M}E = D\hat{C}E$, $E\hat{B}M = C\hat{D}E$ } $\overset{\Delta}{EMB} \sim DEC$; $\frac{EM}{CE} = \frac{MB}{DC} = \frac{EM}{CE} = \frac{3}{6} = \frac{1}{2} = \frac{1x}{2x}$

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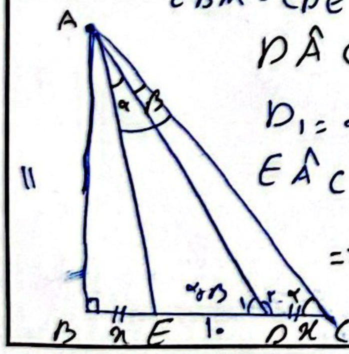

$D\hat{A}C = \beta$

$D_1 = \alpha + \beta$ زاویه خارجی

$E\hat{A}C = \alpha + \beta$ } $D_1 = E\hat{A}C \Rightarrow AED \sim AEC$

$\Rightarrow \frac{AE}{10+x} = \frac{10}{AE} \Rightarrow AE^2 = 100 + 10x$ } $100 + 10x = 121 + x^2$; $0 = x^2 - 10x + 21$; $(x-3)(x-7) = 0$

$(11)^2 + x^2 = AE^2$

$BE = x = DC$

$\boxed{x = 3 , x = 7}$

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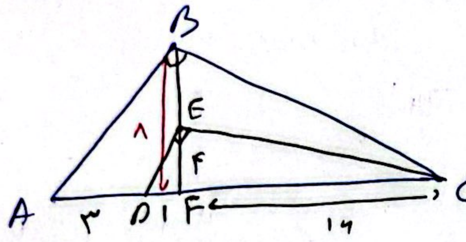

$$EF^2 = DF \times FC$$
$$16 = 1 \times FC$$
$$FC = 16$$
$$BF^2 = AF \times FC$$
$$BF = \sqrt{4 \times 16} \Rightarrow BF = 8$$

$\cancel{BF^2}+$

$$BF^2 + FC^2 = BC^2 \Rightarrow \sqrt{8^2 + 16^2} = \sqrt{8^2(1+2^2)} = \boxed{8\sqrt{5} = BC}$$

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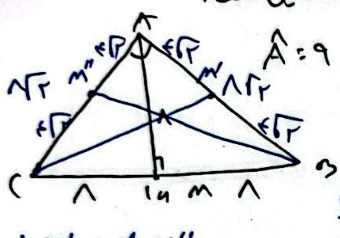
در مثلث قائم الزاویه میانه وارد بر وتر نصف وتر است پس مثلث قائم الزاویه متساوی الساقین است.

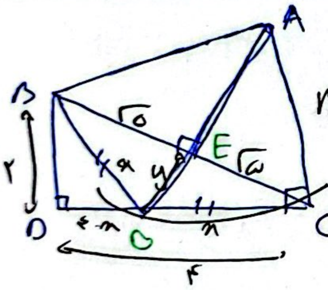


$\hat{A} = 90$

$$AB = \sqrt{8^2 + 8^2} = 8\sqrt{2} = AC$$ متساوی الساقین است

$$BM''^2 = AM''^2 + AB^2$$
$$CM'^2 = AM'^2 + AC^2$$
$$AM' = BM''$$
$$CM'' = \sqrt{(4\sqrt{2})^2 + (8\sqrt{2})^2} = \sqrt{160} = \boxed{4\sqrt{10}}$$

مثلث BOC متساوی الساقین است و در مثلث متساوی الساقین ارتفاع وارد بر قاعده میانه هم است پس



$$2^2 + 4^2 = BC^2$$
$$BC = \sqrt{4+16} = 2\sqrt{5} \qquad BE = EC$$
$$4 + (4-x)^2 = x^2 \Rightarrow y^2 + 5 = \frac{25}{4}$$
$$4 + 16 + x^2 - 8x = x^2 \qquad y^2 = \frac{5}{4} \Rightarrow y = \frac{\sqrt{5}}{2}$$
$$20 = 8x$$
$$x = \frac{5}{2}$$
$$BE^2 = OE \times EA$$
$$5 = \frac{\sqrt{5}}{2} \times EA \Rightarrow EA = \frac{10}{\sqrt{5}} = 2\sqrt{5}$$
$$\boxed{S_{ABE} = \frac{1}{2} \times \sqrt{5} \times 2\sqrt{5} = 5}$$

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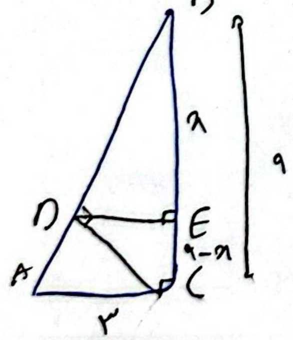

$$DE \parallel AC$$
$$DE^2 = (9-x)(x)$$
$$DE = \sqrt{9x - x^2}$$
$$DE \parallel AC \Rightarrow \frac{DE}{AC} = \frac{BE}{BC}$$
$$\frac{\sqrt{9x-x^2}}{3} = \frac{x}{9} \Rightarrow 3\sqrt{9x-x^2} = x$$
$$9(9x - x^2) = x^2$$
$$81x - 9x^2 = x^2 \Rightarrow 10x^2 - 81x = 0$$
$$x(10x - 81) = 0$$
$$x = 0 \ \times$$
$$10x - 81 = 0 \quad 10x = 81$$
$$10x - 81 = 0 \quad 10x = 81$$
$$\boxed{BE = x = 8.1 = \frac{81}{10}}$$

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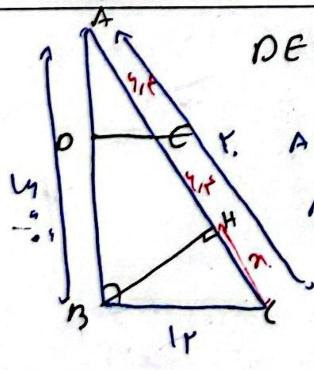

$$DE \parallel BC \Rightarrow \frac{6.4}{20} = \frac{DE}{12} \Rightarrow \frac{12 \times 6.4}{20} = DE$$
$$AB^2 + BC^2 = AC^2$$
$$AC = \sqrt{144 + 256} = 20$$
$$DE = \frac{96}{25} = \boxed{3.84}$$
$$12^2 = x \times 20$$
$$144 = x \times 20 \Rightarrow x = \frac{144}{20} = 7.2 \Rightarrow \frac{20 - 7.2}{2} = 6.4 = AE = EH$$