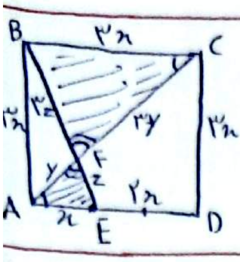
۲۵ عالی نوشتی!

۱- (۲)



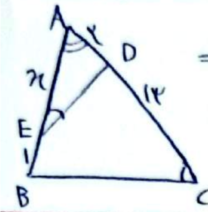
$\frac{BC}{AE}=\frac{CF}{AF}=\frac{BF}{FE}=3$

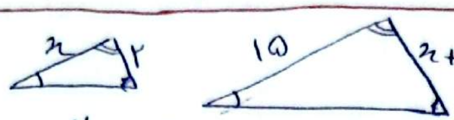
مثلث $ABC \Rightarrow (AC)^2=(AB)^2+(BC)^2 \Rightarrow AC=3x\sqrt{2} \Rightarrow 4y=3x\sqrt{2} \Rightarrow y=\frac{3\sqrt{2}}{4}x$

مثلث $ABE \Rightarrow (BE)^2=(AE)^2+(AB)^2 \Rightarrow 4z=x\sqrt{10} \Rightarrow z=\frac{\sqrt{10}}{4}x$

خواسته سوال: $\frac{EF}{AF}=\frac{\frac{\sqrt{10}}{4}}{\frac{3\sqrt{2}}{4}}=\frac{\sqrt{5}}{3}$

۲- (۲)

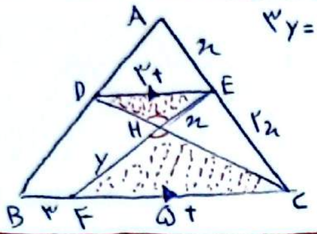




تشابه (زز) $\Rightarrow \frac{AD}{AB}=\frac{AE}{AC}$

$\Rightarrow \frac{2}{x+1}=\frac{x}{15} \Rightarrow 30=x^2+x \Rightarrow x^2+x-30=0 \Rightarrow (x+6)(x-5)=0 \Rightarrow$ $x=5$ ق ق ، $x=-6$ غ ق ق

۳- (۲)

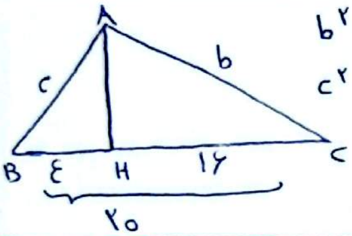


$3y=5x \Rightarrow y=\frac{5}{3}x \qquad EC=1.2y=\frac{6}{5}\times\frac{5}{3}x=2x$

$\frac{AE}{AC}=\frac{DE}{BC} \Rightarrow \frac{1}{3}=\frac{3t}{5t+3} \Rightarrow 9t=5t+3 \Rightarrow t=\frac{3}{4}$

$BC=3+5t=3+\frac{15}{4}=6.75$

۴- (۲)

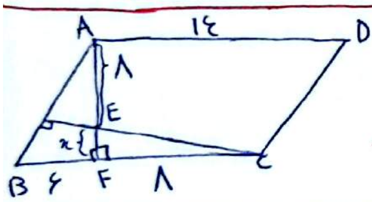


$b^2=CH\times BC=16\times 20$

$c^2=BH\times BC=4\times 20$

$\Rightarrow \frac{b^2}{c^2}=\frac{16\times 20}{4\times 20} \Rightarrow \left(\frac{b}{c}\right)^2=\frac{16}{4} \Rightarrow \frac{b}{c}=2$

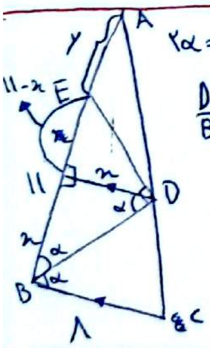
۵- (۲)



$\frac{EF}{BF}=\frac{FC}{AF} \Rightarrow \frac{x}{6}=\frac{8}{8+x} \Rightarrow x^2+8x-48=0 \Rightarrow (x-4)(x+12)=0$

$\xrightarrow{x>0} x=4 \qquad AF=8+4=12$

۶- (۲)



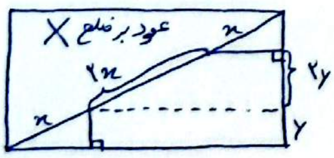
$2\alpha=90^\circ=\hat{B}$

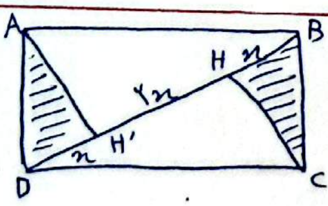
$x=11-x \Rightarrow 2x=11 \Rightarrow x=5.5$

$\frac{DH}{BC}=\frac{AH}{AB} \Rightarrow \frac{5.5}{8}=\frac{y+5.5}{y+11} \Rightarrow 8y+44=5.5y+60.5 \Rightarrow 2.5y=16.5$

$\Rightarrow y=6.6$

۷- (۲)



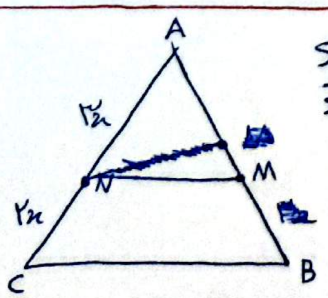


$h^2=x\times 3x \Rightarrow h=\sqrt{3}x$

$S_{\square}=2\times S_{\Delta ABD}=2\times\frac{\sqrt{3}x\times 4x}{2}=\sqrt{3}x\times 4x=4\sqrt{3}x^2$

$S_{\Delta\,\text{توجه}}=\frac{h\times x}{2}=\frac{\sqrt{3}x^2}{2} \Rightarrow \frac{S_{\square}}{S_{\Delta\,\text{توجه}}}=\frac{4\sqrt{3}x^2}{\frac{\sqrt{3}x^2}{2}}=8$

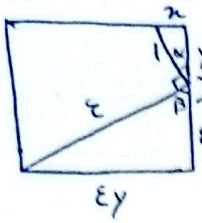
۸- (۲)



$\frac{S_{BMN}}{S_{ABC}}=\frac{BM\times BN}{BA\times BC}=\frac{BM}{AB}\times\frac{3}{5}=\frac{1}{3} \Rightarrow \frac{BM}{AB}=\frac{5}{9}$

$\rightarrow \frac{BM}{AM}=\frac{5}{4}=1.25$

-۹



$۴y = ۴x + y \Rightarrow ۳y = ۴x$

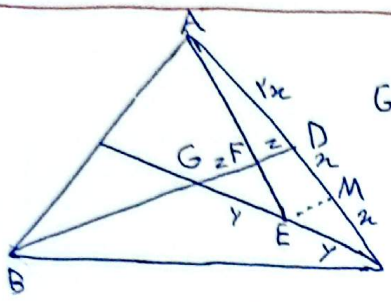
اعداد روی تصویری باشد ← دو مثلث متشابه

$۴x = ۳y \quad (۳y)^۲ + (۴y)^۲ = ۱۶ \Rightarrow ۲۵y^۲ = ۱۶ \Rightarrow y = \frac{۴}{۵}$

$۴y = \frac{۴}{۵} \times ۴ = \frac{۱۶}{۵} \Longrightarrow$

$S_{\square} = \frac{۱۶}{۵} \times \frac{۱۶}{۵} = ۱۰,۲۴$ ✓ (۲)

-۱۰



$\frac{GD}{BD} = \frac{۱}{۲}$ ، $AD = DC$ ، میانه مثلث BM

$\triangle GDC : ME \parallel GD \xrightarrow{\text{تالس}} \frac{EC}{EG} = \frac{CM}{DM} \Rightarrow EC = EG \longrightarrow ۱ = \frac{CM}{DM} \Rightarrow CM = DM$ (۲)

$\triangle AEM : FD \parallel EM \xrightarrow{\text{تالس}} \frac{AD}{AM} = \frac{FD}{EM} \Rightarrow \frac{۲x}{۳x} = \frac{FD}{EM} \Rightarrow EM = \frac{۳}{۲} FD$

$\triangle GDC : EM \parallel DG \xrightarrow{\text{تالس}} \frac{CM}{CD} = \frac{EM}{GD} \Rightarrow \frac{x}{۲x} = \frac{EM}{GD} \Rightarrow GD = ۲EM$

$\longrightarrow GD = ۲\left(\frac{۳}{۲} FD\right) \Rightarrow GD = ۳FD$

$\frac{GD}{BD} = \frac{۱}{۳} \Rightarrow \frac{۳FD}{BD} = \frac{۱}{۳} \Rightarrow \frac{BD}{FD} = ۹$ ✓