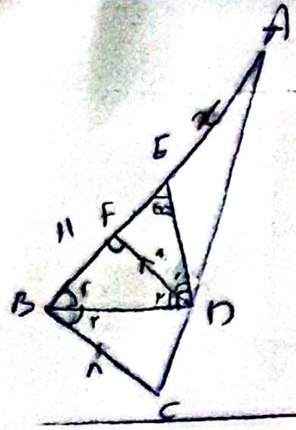


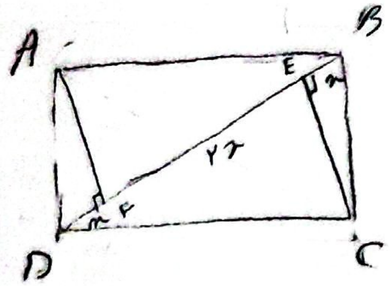
$DF \parallel BC \to \hat{B}=\hat{F}=90^\circ \Rightarrow \frac{90}{2}=45=D_1=D_2=B_1=B_2$

$ED=x=DB \to \hat{E}=\hat{B}_1=45 \Rightarrow EF=FD,\ BF=FD \Rightarrow EF=BF=\frac{11}{2}=5.5$

$DF \parallel BC \xrightarrow{\text{تالس}} \frac{AF}{AB}=\frac{AD}{AC}=\frac{FD}{BC}$ $\quad (AF=x+5.5,\ AB=x+11,\ FD=5.5,\ BC=8)$ $\to 8x+44=5.5x+60.5$

$x=\frac{16.5}{2.5}=6.6$ ← جواب =

$AF=6.6$



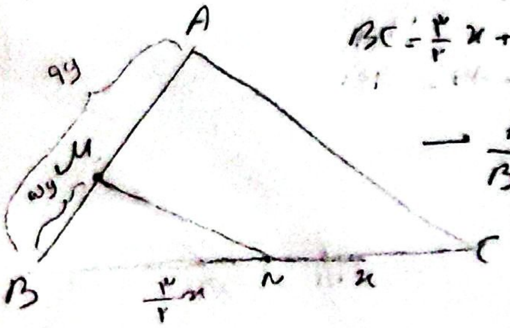
$S_{AFB}=\frac{FB\times AF}{2}=3S$ $\quad (FB=3x)$

$S_{AFD}=\frac{DF\times AF}{2}=S$ $\quad (DF=x)$

$S_{EDC}=\frac{DE\times CE}{2}=3S$ $\quad (DE=3x)$

$S_{BEC}=\frac{EB\times CE}{2}=S$ $\quad (EB=x)$

$\frac{S_{ABCD}}{S_{AFD}}=\frac{3S+S+3S+S}{S}=8$

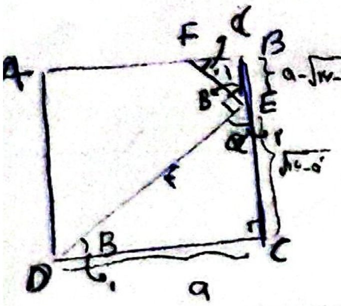


$BC=\frac{3}{2}x+x=\frac{5}{2}x$ $\qquad \frac{S_{ABC}}{S_{MBN}}=\frac{\sin B\ AB\times BC}{\sin B\times BM\times BN}=3$

$\to \frac{AB}{BM}=3\times\frac{3}{5}=\frac{9}{5} \to AB=9y,\ BM=5y$

$AB-BM=4y=AM$

$\frac{BM}{AM}=\frac{5y}{4y}=\frac{5}{4}$



$\hat{B}=\hat{C}=90$

$\hat{a}+\hat{B}=90,\ \hat{B}+\hat{E}_1=90 \Rightarrow E_1=a$

$\hat{E}_2+\hat{D}_1=90,\ \hat{a}+\hat{B}=90 \Rightarrow D_1=B$

$\Delta\sim\Delta$ $\ (FBE\sim ECD) \to \frac{4}{1}=\frac{DE}{BE}=\frac{EC}{FB}$ $\quad (BE=a-\sqrt{16-a^2})$

$a=4a-4\sqrt{16-a^2} \to 3a=4\sqrt{16-a^2}$

$9a^2=16\times16-16a^2 \to 25a^2=16^2 \to a^2=\frac{256}{25}$

$\sqrt{16-a^2}=EC \qquad EB=a-\sqrt{16-a^2}$

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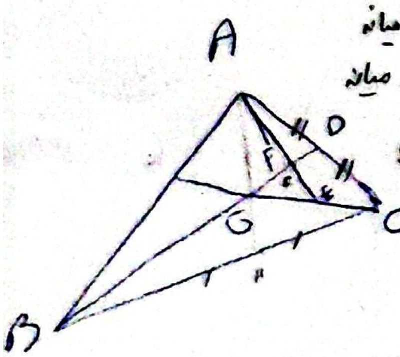


میانه $BD \longrightarrow AD=DC$ ① $\Rightarrow GD$ ← میانه

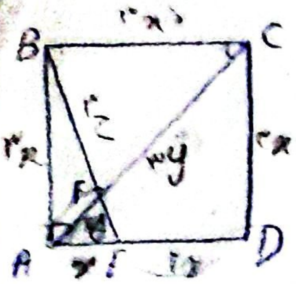
میانه $AH \longrightarrow$ از G می‌گذرد ② $\to GE=EC$ (فرض) $\Rightarrow AE$ میانه

①② $\triangle AGC$ { GD میانه، AE میانه } ⇒ F محل تلاقی ⟶ $FD=x$، $GF=2x$

AC محل تلاقی ⟶ $BG=6x$

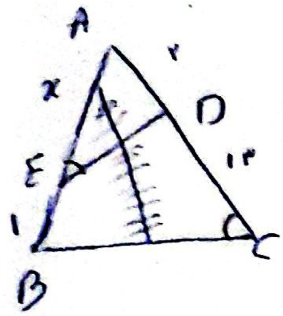
$\frac{BD}{FD}=\frac{6x+2x+x}{x}=9$ ← جواب

نام و نام خانوادگی: پارسا شهریاری — تکلیف شماره یک — ۲۰ — گروه یازدهم دختر A



$\frac{4}{3} = \frac{BE}{AC} = \frac{4z}{4y} \to \frac{\sqrt{10x^2}}{\sqrt{18x^2}} = \frac{x\sqrt{10}}{3x\sqrt{2}} = \frac{\sqrt{5}}{3}$

(۲)



اگر $A\hat{E}D = A\hat{C}B$ (۲)

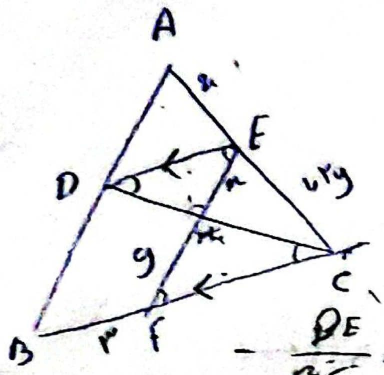
$\hat{A} = \hat{A}$ مشترک، $\hat{E} = \hat{C}$ $\Big\} \to \triangle AED \sim \triangle ABC$

نسبت تشابه: $\frac{AD}{AB} = \frac{ED}{BC} = \frac{AE}{AC} \to \frac{2}{1+x} = \frac{x}{15} \to 30 = x + x^2 \to x^2 + x - 30 = 0$

$(x+6)(x-5) = 0$

$x = -6$ غ ق ق

$x = 5$



$3y = 5x \to x = \frac{3}{5}y \to \frac{x}{y} = \frac{3}{5}$

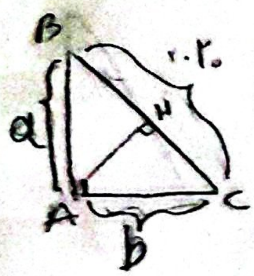
$\hat{E} = \hat{F}$، $\hat{D} = \hat{C}$، $H_1 = H_2$ $\Big\} \to \triangle DEH \sim \triangle FHC \to \frac{EH}{HF} = \frac{DH}{HC} = \frac{DE}{FC}$

$\frac{DE}{FC} = \frac{x}{y} = \frac{3}{5} = \frac{6}{10}$

$DE = \frac{6FC}{10}$ (1)

$DE \parallel BC$ تالس $\frac{AE}{BE} = \frac{AD}{AB} = \frac{DE}{BC} \to \frac{\frac{3}{5}y}{\frac{18}{10}} = \frac{3}{9} = \frac{1}{3} = \frac{x}{1.2y + x}$ $\quad x = 1k$، $y = \frac{5}{3}k$ (۲)

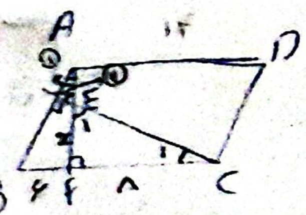
$\frac{DE}{BC} = \frac{1}{3} \to (1) \Rightarrow \frac{DE}{FC + BF} = \frac{\frac{6}{10}FC}{3 + FC} = \frac{6FC}{30 + 10FC} = \frac{1}{3} \to FC = 3.75 \to BC = 6.75$



$AC^2 = CH \times CB \to HC = \frac{b^2}{20} = 16 \to b^2 = 320 \to b = 8\sqrt{5}$

$AB^2 = BH \times BC \to BH = \frac{a^2}{20} = 4 \to a^2 = 80 \to a = 4\sqrt{5}$ (۲)

$\frac{AB}{AC} = \frac{a}{b} = \frac{4\sqrt{5}}{8\sqrt{5}} = \frac{1}{2}$ جواب



$\hat{E}_1 + \hat{C}_1 = 90$، $\hat{E}_2 + \hat{A}_1 = 90$، $\hat{E}_1 = \hat{E}_2$ متقابل به رأس $\Big\} \to \hat{C}_1 = \hat{A}_1$

$\hat{C}_1 = \hat{A}_1$، $F = 90$ $\Big\} \triangle ABF \sim \triangle EFC$ (۲)

$\frac{EF}{BF} = \frac{EC}{AB} = \frac{FC}{AF}$

$\frac{x}{4} = \frac{8}{x+8} \to 32 = x^2 + 8x \to (x+12)(x-4) = 0$

(1) $x \neq -12$، $x = 4$

$\Rightarrow$ (1) $EF = 4$، $AE = 8 \Rightarrow AF = 12$ جواب