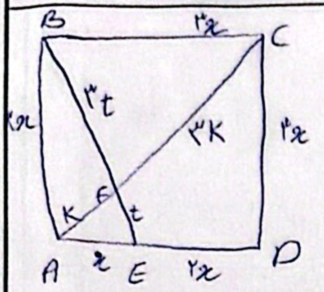
نام و نام خانوادگی ...صبا ابراهیم... **پاسخنامه تشریحی تکلیف شماره** ...۲۱... **کلاس** ...یازدهم... B دبیرستان...

۱

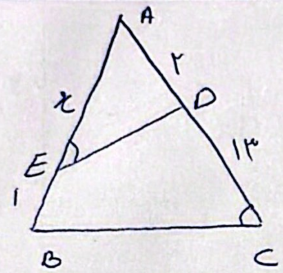


$BE^2 = x^2 + (3x)^2 \to BE = \sqrt{10}\,x$

$AC^2 = (3x)^2 + (3x)^2 = \sqrt{18}\,x$

$\frac{t}{k} = \frac{BE}{AC} = \frac{4t}{4k} = \frac{\sqrt{10x^2}}{\sqrt{18x^2}} = \sqrt{\frac{10}{18}} = \frac{\sqrt{5}}{3}$

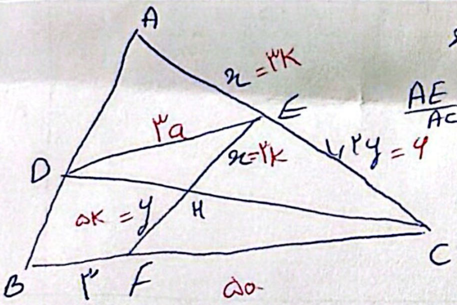
۲



$\hat{ADE} \sim \hat{ABC} \to \frac{2}{x+1} = \frac{x}{15} \to x_1 = 5$ ✓ ، $x_2 = -6$ غ‌ق‌ق

$\frac{AD}{AB} = \frac{AE}{AC} = \frac{ED}{BC}$

۳

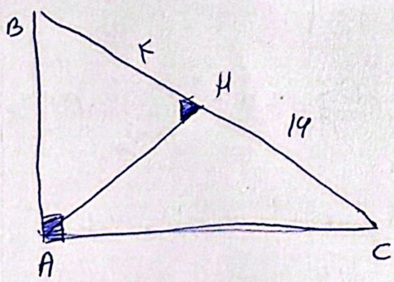


$x = 3k \quad y = 5k$

$\frac{AE}{AC} = \frac{DE}{BC} = \frac{3a}{3+5a} = \frac{3k}{9k} = \frac{1}{3} \to a = \frac{3}{4}$

$BC = 3 + 5\times\frac{3}{4} = \frac{15}{4} + 3 = \frac{27}{4} = 6{,}75$

۴

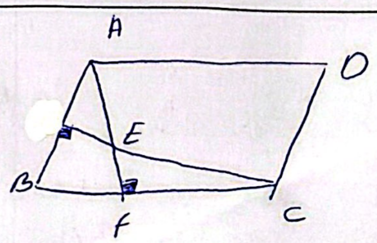


$AB^2 = BH\times BC \to 4\times 20 = AB^2$

$AC^2 = CH\times BC \to 16\times 20 = AC^2$

$\frac{AC^2}{AB^2} = \frac{16\times 20}{4\times 20} = 4 \to \frac{AC}{AB} = \sqrt{4} = 2$

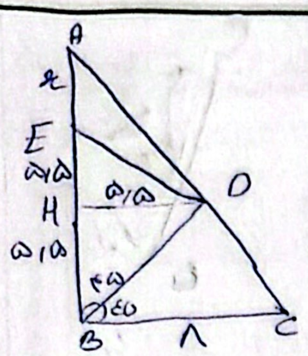
۵



$\hat{BAF} \overset{\text{زز}}{\sim} ECF \qquad \frac{BF}{EF} = \frac{AF}{CF} \to \frac{6}{x} = \frac{8+x}{8}$

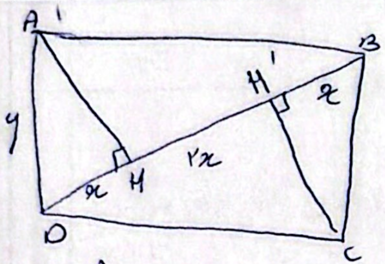
$\to x(x+8) = 48 \to x^2 + 8x - 48 = 0$ → $x = -12$ غ‌ق‌ق ، $x = 4$

$x = 4 \to AF = 8 + x = 12$



$\frac{AH}{AB}=\frac{DH}{BC} \rightarrow \frac{۵/۵+x}{۱۱+x}=\frac{۵/۵}{۸} \rightarrow ۴۴+۸x=۶۰/۵+۵/۵x$

$\rightarrow ۲/۵x=۱۶/۵ \rightarrow x=\frac{۱۶/۵}{۲/۵}=۶/۶=AE$ ۶



$HH'=۲DH=۲BH'=۲x$

$A\hat{B}D \rightarrow y^۲=x(۴x)$ $AD^۲=DH\times DB$

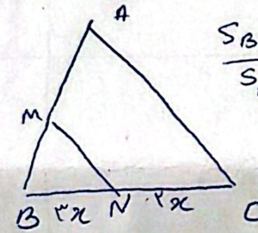
$\rightarrow y=۲x$

$A\hat{B}D \rightarrow AB^۲=BD^۲-AD^۲ \rightarrow AB^۲=(۴x)^۲-(۲x)^۲=۱۲x^۲$ ۷

$\rightarrow AB=۲\sqrt{۳}x$

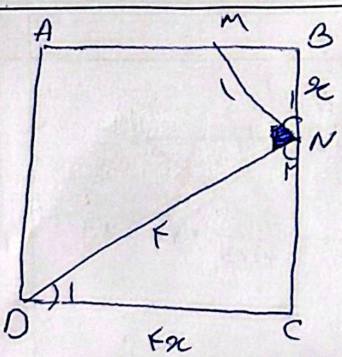
$A\hat{D}H: AH^۲=AD^۲-DH^۲ \rightarrow AH^۲=(۲x)^۲-(x)^۲=۳x^۲ \rightarrow AH=\sqrt{۳}x$

$\frac{S_{مستطیل}}{S_{ADH}}=\frac{AB\times AD}{\frac{۱}{۲}AH\times DH}=\frac{(۲\sqrt{۳}x)(۲x)}{\frac{۱}{۲}(\sqrt{۳}x)(x)}=$ ۸



$\frac{S_{BMN}}{S_{ABC}}=\frac{BM\times BN}{BA\times BC}=\frac{BM}{AB}\times\frac{۳}{۵}=\frac{۱}{۳} \rightarrow \frac{BM}{AB}=\frac{۵}{۹} \rightarrow$

$\frac{BM}{AM}=\frac{۵}{۴}=۱/۲۵$ ۸



$M\hat{N}D=۹۰° \rightarrow \hat{N}_۱+\hat{N}_۲=۹۰°$

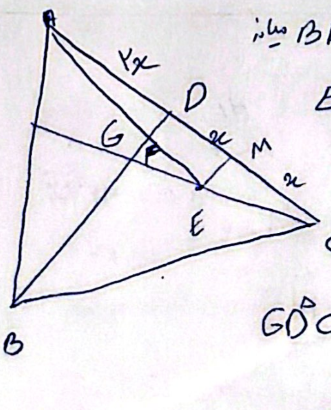
$D\hat{N}C: \hat{C}=۹۰° \rightarrow \hat{D}_۱+\hat{N}_۲=۹۰°$ $\} \hat{D}_۱=\hat{N}_۱$

$D\hat{N}C \sim B\hat{M}N \rightarrow \frac{DN}{MN}=\frac{DC}{BN} \rightarrow \frac{۴}{۱}=\frac{DC}{x} \rightarrow DC=۴x$ ۹

$BC=DC=۴x \rightarrow NC=۳x$

$D\hat{N}C: DN^۲=DC^۲+NC^۲ \rightarrow ۴^۲=(۴x)^۲+(۳x)^۲ \rightarrow ۱۶=۲۵x^۲$

$\rightarrow x=\frac{۴}{۵}$ ضلع مربع $S_{ABCD}=DC^۲=(\frac{۱۶}{۵})^۲=\frac{۲۵۶}{۲۵}=۱۰/۲۴$



میانه $BD \rightarrow \frac{GD}{BD}=\frac{۱}{۳}$ ، $AD=DC$

$E||BD$ $G\hat{D}C: EM||GD \rightarrow \frac{EC}{EG}=\frac{CM}{DM} \rightarrow CM=DM=x$

$AD=۲x$ ۱۰

$A\hat{E}M: FD||EM \rightarrow \frac{AD}{AM}=\frac{FD}{EM} \rightarrow \frac{۲x}{۳x}=\frac{FD}{EM} \rightarrow EM=\frac{۳}{۲}FD$

$G\hat{D}C: EM||DG \rightarrow \frac{CM}{CD}=\frac{EM}{GD} \rightarrow \frac{x}{۲x}=\frac{EM}{GD} \rightarrow GD=۲EM$

$\rightarrow GD=۲(\frac{۳}{۲}FD)$ $\frac{GD}{BD}=\frac{۱}{۳} \rightarrow \frac{۳FD}{BD}=\frac{۱}{۳} \rightarrow \frac{BD}{FD}=۹$