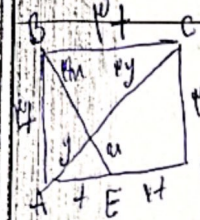
نام و نام خانوادگی .....محمدرضا نیازی.. پاسخنامه تشریحی تکلیف شماره ..... کلاس .....



$BC=CD=AD=AB=4 \Rightarrow \frac{BC}{AE}=\frac{4}{4}=3$ $\quad AEf \sim BfC$

$\Rightarrow \hat{f_1}=\hat{f_2}$ $\quad \hat{C_1}=\hat{A_1}$

$\frac{EC}{fA}=3 \Rightarrow \frac{fC}{y}=3 \Rightarrow fC=3y$ $\quad \frac{fB}{m}=3$ $\quad fB=3m$

۱

$\overset{D}{ABE} \simeq BE^2 \neq AE^2+AB^2 \Rightarrow BE^2=4^2+9^2 \Rightarrow BE^2=10^2 \Rightarrow BE=\sqrt{10}$

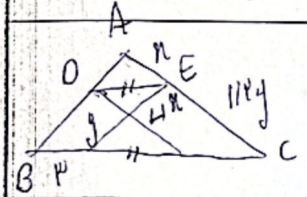
$ACD=AC^2=CD^2+AD^2 \Rightarrow AC^2=9^2+9^2=18^2 \Rightarrow AC^2=18^2 \Rightarrow AC=9\sqrt{2} \Rightarrow \frac{Ef}{AF}=\frac{m}{y} \Rightarrow \frac{3m}{2y}$

$\Rightarrow \frac{BE}{AC}=\frac{\sqrt{10}}{9\sqrt{2}} \Rightarrow \frac{\sqrt{10}}{2\sqrt{2}}=\frac{\sqrt{5}}{3}$

$\frac{AD}{AB}=\frac{ED}{BC}=\frac{AE}{AC} \Rightarrow \frac{AE}{AC}=\frac{AD}{AB} \Rightarrow \frac{9}{15}=\frac{2}{m+1} \Rightarrow 9m+9=30$

$\Rightarrow m^2+m-30=0 \rightarrow (m+6)(m-5) \Rightarrow \boxed{m=5}$

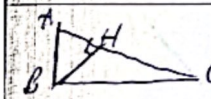
۲



$EC=11y \Rightarrow 11y(\frac{2}{3}y)=22m \Rightarrow \frac{AE}{AC}=\frac{m}{3m}=\frac{1}{3} \Rightarrow \frac{DE}{BC}=\frac{1}{3} \Rightarrow DE=\frac{1}{3}BC$

$\frac{DE}{fC}=\frac{m}{y}=\frac{3}{5} \Rightarrow DE=\frac{3}{5}fC$ نوشتن تشابه DEH و fCH

$\Rightarrow \frac{3}{5}fC=\frac{1}{3}BC \Rightarrow BC=fC+3 \Rightarrow \frac{3}{5}fC=\frac{1}{3}fC+1 \Rightarrow fC=\frac{15}{4} \Rightarrow BC=\frac{15}{4}+3=\frac{27}{4}=6/75$ ۳

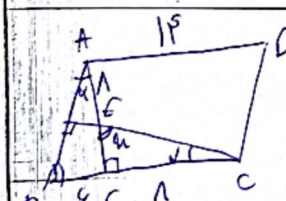


$\Rightarrow BH=\frac{AB^2}{BC}$ $\quad HC=\frac{AC^2}{BC}$ $\quad AH^2, BH, HC$

$\Rightarrow min(BH, HC)=8 \Rightarrow BH=8$ $\quad HC=14$ $\quad \Rightarrow BH+HC=BC=20$

$\Rightarrow BH=\frac{AB^2}{BC}=\frac{AB^2}{20}=8 \Rightarrow AB^2=80 \Rightarrow AB=\sqrt{80}=4\sqrt{5} \Rightarrow HC=\frac{AC^2}{20}=14$ ۴

$\Rightarrow AC^2=320 \Rightarrow AC=8\sqrt{5} \Rightarrow \frac{4\sqrt{5}}{8\sqrt{5}}=\frac{1}{2}$

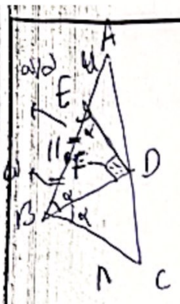


$\overset{D}{ABf} \simeq \overset{D}{BEf} \Rightarrow \frac{m+8}{8}=\frac{4}{m} \Rightarrow m^2+8m-32=0$

$\rightarrow (m+12)(m-4) \Rightarrow m=4$

$\Rightarrow m+8 \Rightarrow \boxed{AD=12}$

۵

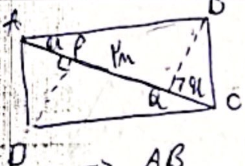


⇒ $E\hat{D}F = D\hat{B}F$

⇒ $\frac{x+11}{5/5+x} = \frac{8}{5/5}$ ⇒ $44 + 8x = 5/5x + 11 \times 5/5$

⇒ $2/5x = 11(5/5 - 4)$

⇒ $x = \frac{11 \times 1/5}{2/5} = \frac{66}{10}$ ⇒ $x = 6/6$ ۶



$A\hat{D}P$ و $A\hat{B}Q$ = [illegible] ⇒ $\hat{A} = \hat{A}$ ⇒ $A\hat{B}Q \simeq A\hat{D}P$

⇒ $\frac{AB}{AD} = \frac{AP}{AQ}$ ⇒ $AQ = AP + PQ = x + 2x = 3x$

⇒ $\frac{AB}{AP} = \frac{x}{3x} = \frac{1}{3}$ ⇒ $S = AB \times AP$ ⇒ $AP = 3x$ ⇒ $S = 3x^2$ ⇒ $S_{A\hat{B}Q} = \frac{1}{2} AQ \times BQ$ ۷

⇒ $\frac{BQ}{DP} = \frac{AB}{AD} = \frac{1}{3}$ ⇒ $BQ = h$ ⇒ $DP = 3h$ ⇒ $S_{ABQ} = \frac{1}{2} x h$ ⇒ $S_{ADP} = \frac{1}{2} x \times 3h$

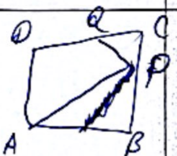
⇒ $\frac{S}{S} = 4$ $\frac{S_{big}}{S_{small}} = \frac{6}{1} = 6$ ⇒ $6 \times \frac{4}{3} = 8$

$\frac{BM}{AM} = x$ ⇒ $BM = xAM$ ⇒ $AB = AM + BM = AM(1+x)$ ⇒ $\frac{BM}{AB} = \frac{x}{1+x}$ ⇒ $\frac{BN}{NC} = \frac{3}{2}$ ⇒ $\frac{BN}{BC} = \frac{3}{5}$

⇒ $\frac{S_{BMN}}{S_{ABC}} = \frac{BM}{AB} \times \frac{BN}{BC}$ ⇒ $\frac{S_{BMN}}{ABC} = \frac{x}{1+x} \times \frac{3}{5}$ ⇒ $\frac{x}{x+1} \times \frac{3}{5} = \frac{1}{3}$ ⇒ $9x = 5 + 5x$ ⇒ $x = \frac{5}{4}$

⇒ $\frac{BM}{AM} = \frac{5}{4}$ ۸

$AP = 4$ $PQ = 1$ ⇒ $DQ = PQ = 1$ ⇒ S = ضلع مربع ⇒ $AQ = S$



→ $PP = 1$ $PP \parallel PQ$ ⇒ $AP = AP + PP$ ⇒ $4 + 1 = 5$

$AP = 5$ ⇒ AC = قطر ⇒ $AC = S\sqrt{2}$ پاره خط $PQ=1$ را به اندازه AP منتقل می‌کنیم ۹

⇒ $(AC)^2 = (AP)^2 + S^2$ ⇒ $(S\sqrt{2})^2 = 5^2 + S^2$ ⇒ $2S^2 = (5 + S^2)$ ⇒ $S^2 = 25$

G = مرکز ثقل ⇒ $GE = EC$ ⇒ $\frac{AG}{GM} = 2$ ⇒ $CG = GE = \frac{EC}{2}$

⇒ B و G و C = هم‌خط‌اند ⇒ $\frac{BG}{GM} = 2$ ⇒ $\frac{BD}{FD} = \frac{BG}{GF}$ ⇒ $\frac{BG}{GC} = 2$ ⇒ $GC = GE$

A F E = هم‌خط‌اند

B F = هم‌خط‌اند ۱۰

⇒ $GE = GF$ ⇒ $\frac{BG}{GF} = 2$ ⇒ $\frac{BD}{FD} = 2$