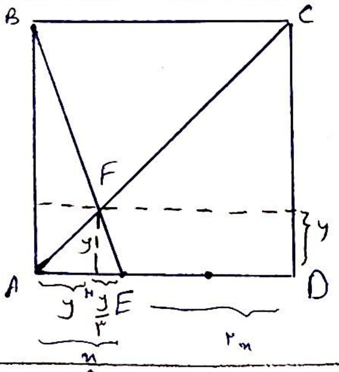
نام و نام خانوادگی ....[illegible].... پاسخنامه تشریحی تکلیف شماره ...۲۱... کلاس ...یازدهم [illegible] A...

۲۵ عالی نوشتی!

۱ (۲)



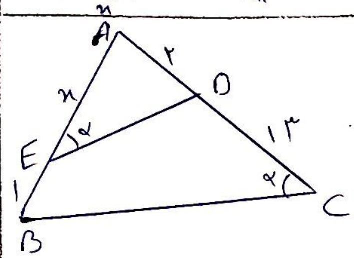
$m_{BE} = -3 \longrightarrow FH = y \longrightarrow EH = \frac{y}{3}$

$m_{AC} = 1 \longrightarrow FH = y \longrightarrow AH = y$

$\longrightarrow AF = \sqrt{y^2 + y^2} = \sqrt{2}\, y$

$\longrightarrow FE = \sqrt{y^2 + \frac{y^2}{9}} = \sqrt{\frac{10}{9}}\, y = \frac{\sqrt{10}}{3} y \longrightarrow \frac{EF}{AF} = \frac{\frac{\sqrt{10}}{3}}{\sqrt{2}} = \frac{\sqrt{5}}{3}$

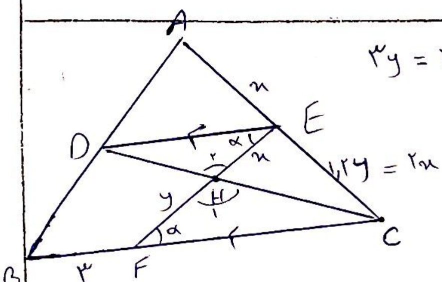
۲ (۲)



$\left.\begin{array}{l} \hat{A} = \hat{A} \\ A\hat{E}D = A\hat{C}B \end{array}\right\} \longrightarrow \overset{\triangle}{ADE} \sim \overset{\triangle}{ABC} \rightarrow \frac{AE}{AC} = \frac{AD}{AB}$

$\rightarrow \frac{x}{15} = \frac{2}{x+1} \rightarrow x^2 + x = 30 \rightarrow x^2 + x - 30 = 0 \rightarrow \begin{cases} x = -6 \;\times \\ x = 5 \end{cases}$

۳ (۲)



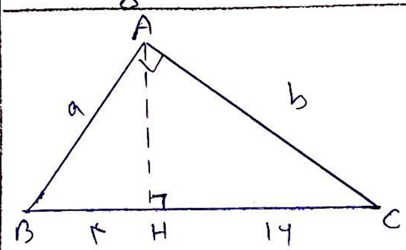
$3y = 5x \rightarrow y = \frac{5}{3}x \rightarrow 1.2y = 2x$

$\left.\begin{array}{l} D\hat{E}H = H\hat{F}C \\ \hat{H}_1 = \hat{H}_2 \end{array}\right\} \rightarrow \overset{\triangle}{DHF} \sim \overset{\triangle}{FHC} \rightarrow \frac{EH}{HF} = \frac{DE}{FC} = \frac{x}{y} = \frac{3}{5} \quad (1)$

$\frac{DE}{BC} = \frac{AE}{AC} = \frac{x}{3x} = \frac{1}{3} \xrightarrow{(2)} (1),(2) \quad \frac{DE}{FC+3} = \frac{1}{3} \rightarrow \frac{\frac{3}{5}FC}{FC+3} = \frac{1}{3}$

$\rightarrow \frac{9}{5} FC = FC + 3 \rightarrow \frac{4}{5} FC = 3 \rightarrow FC = \frac{15}{4} \rightarrow BC = FC + 3 = \frac{15}{4} + 3 = \frac{27}{4}$

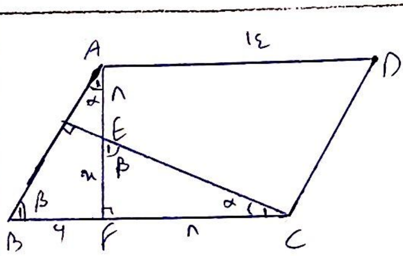
۴ (۲)



$\rightarrow \begin{cases} b^2 = CH \times BC = 16 \times 20 \\ a^2 = BH \times BC = 4 \times 20 \end{cases}$

$\rightarrow \frac{b^2}{a^2} = \frac{16}{4} \longrightarrow \frac{b}{a} = 2$

۵ (۲)



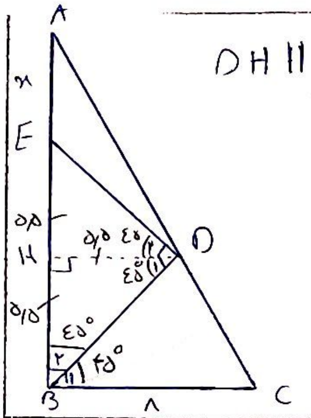
$\left.\begin{array}{l} \hat{C}_1 + \hat{B}_1 = 90^\circ \\ \hat{B}_1 + \hat{A}_1 = 90^\circ \end{array}\right\} \rightarrow \hat{C}_1 = \hat{A}_1$

$\left.\begin{array}{l} \hat{E}_1 + \hat{C}_1 = 90^\circ \\ \hat{C}_1 + \hat{B}_1 = 90^\circ \end{array}\right\} \hat{E}_1 = \hat{B}_1$

$\overset{\triangle}{FCE} \sim \overset{\triangle}{ABF} \longrightarrow \frac{FC}{AF} = \frac{EF}{BF} \Rightarrow \frac{8}{8+x} = \frac{x}{6}$

$\rightarrow x^2 + 8x = 48 \longrightarrow x^2 + 8x - 48 = 0 \longrightarrow x = \begin{cases} -12 \\ 4 \;\checkmark\checkmark \end{cases}$

$\longrightarrow AF = 12$



$DH \parallel BC \rightarrow \hat{H} = \hat{B} = 90^\circ$

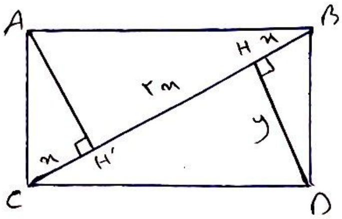
$\rightarrow \hat{B}_1 = \hat{B}_2 = 45^\circ \xrightarrow[H=90^\circ]{D=90^\circ} \hat{D}_1 = \hat{D}_2 = 45^\circ$

$\rightarrow DH = BH = HE = \frac{11}{2} = 5.5$

$\rightarrow \frac{x+5.5}{x+11} = \frac{5.5}{8} \rightarrow 8x + 44 = 5.5x + 60.5 \rightarrow 2.5x = 16.5$

$\rightarrow AE = x = 6.6$ ✓

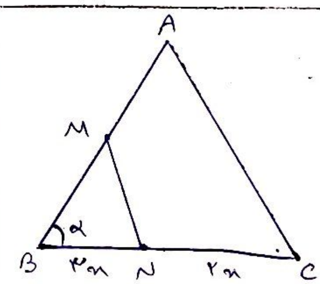
۲ ۶



$S_{\underset{ABCD}{\square}} = 2 \times \frac{y \times 4x}{2} = 4xy$

$S_{\overset{\triangle}{BHD}} = \frac{xy}{2} \rightarrow \frac{S_{ABCD}}{S_{BHD}} = \frac{4xy}{\frac{xy}{2}} = 8$ ✓

۲ ۷

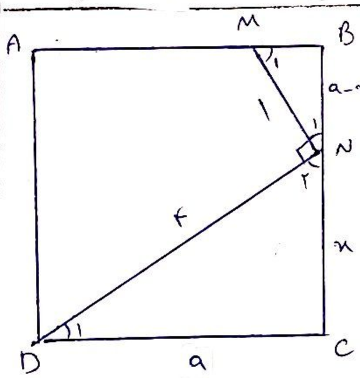


$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} BC \times AB \times \cancel{\sin\alpha}}{\frac{1}{2} BN \times BM \times \cancel{\sin\alpha}} \Longrightarrow \underbrace{\frac{BC}{BN}}_{\frac{5}{3}} \times \frac{AB}{BM} = 3$

$\rightarrow \frac{5}{3} \times \frac{AB}{BM} = 3 \rightarrow \frac{AB}{BM} = \frac{9}{5} \rightarrow \frac{AB - BM}{BM} = \frac{9-5}{5}$

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

۲ ۸



$\left.\begin{array}{l} \hat{N}_2 + \hat{N}_1 = 90^\circ \\ \hat{N}_2 + \hat{D}_1 = 90^\circ \end{array}\right\} \rightarrow \hat{N}_1 = \hat{D}_1$

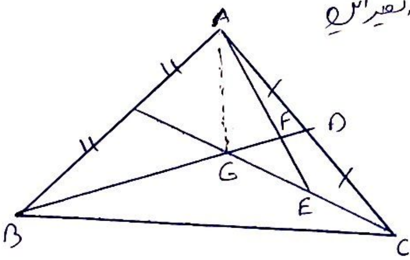
$\left.\begin{array}{l} \hat{N}_2 + \hat{N}_1 = 90^\circ \\ \hat{N}_1 + \hat{M}_1 = 90^\circ \end{array}\right\} \rightarrow \hat{M}_1 = \hat{N}_2$

$\rightarrow \overset{\triangle}{MNB} \sim \overset{\triangle}{NCD} \rightarrow \frac{DN}{MN} = \frac{DC}{NB} \rightarrow \frac{4}{1} = \frac{a}{a-x}$

$\rightarrow 4a - 4x = a \rightarrow 3a = 4x \rightarrow x = \frac{3}{4}a \rightarrow a^2 + x^2 = 16$

$\rightarrow a^2 + \frac{9}{16}a^2 = 16 \rightarrow \frac{25}{16}a^2 = 16 \rightarrow a^2 = \frac{16 \times 16}{25} \rightarrow S = \frac{16 \times 16}{25} = 10.24$ ✓

۲ ۹



مرکز ثقل محل برخورد میانه‌ها است و فاصله آن تا وسط هر ضلع برابر $\frac{1}{3}$ اندازه میانه نظیر این ضلع است و فاصله‌اش تا هر رأس $\frac{2}{3}$ اندازه میانه نظیر آن است

$\rightarrow \frac{GD}{BD} = \frac{1}{3} \rightarrow$ GD میانه برای مثلث AGC

$\rightarrow FD = \frac{1}{3} GD \rightarrow \frac{FD}{BD} = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$

$\rightarrow \frac{BD}{FD} = 9$ ✓

۲ ۱۰