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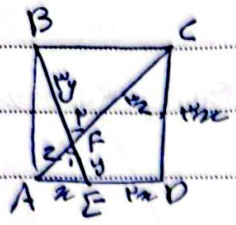


$۴z = ۳\sqrt{۲}x \Rightarrow z = \frac{۳\sqrt{۲}x}{۴}$

$۴y = \sqrt{۱۵}x \Rightarrow y = \frac{\sqrt{۱۵}x}{۴}$

$\frac{EF}{AF} = \frac{\frac{\sqrt{۱۵}x}{۴}}{\frac{۳\sqrt{۲}x}{۴}} = \frac{\sqrt{۱۵}}{۳\sqrt{۲}} = \frac{\sqrt{۵}}{۳}$ (۱)

$AED \sim ABC$ (ii) $\Rightarrow \hat{A} = \hat{A}$, $A\hat{E}D = A\hat{C}B$

$\left\{ \frac{۳}{x+۱} = \frac{ED}{BC} = \frac{x}{۱۵} \right. \Rightarrow x^۲ + x = ۳۰$ (۴)

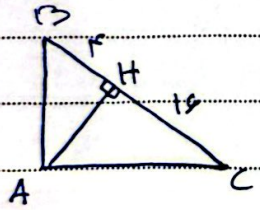
$(x+۶)(x-۵)$ (۵)

$x < -۶$ ✗ , $x > ۵$ ✓

$۳y = ۵x \Rightarrow \frac{x}{y} = \frac{۳}{۵} \Rightarrow \frac{DE}{CF} = \frac{۳}{۵} \Rightarrow DE = \frac{۳}{۵} CF$ (۳)

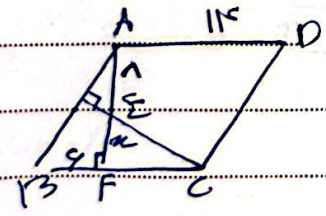
$\frac{DE}{BC} = \frac{AE}{AC} \Rightarrow \frac{\frac{۳}{۵}CF}{۳+CF} = \frac{x}{x+۱+y} = \frac{x}{۳x} = \frac{۱}{۳} \Rightarrow CF = ۳,۷۵$ (۲)

$BC = ۳ + ۳,۷۵ = ۶,۷۵$



$AH^۲ = BH \times CH = ۶۴ \Rightarrow AH = ۸$ (۴)

$\frac{AC}{AB} = \frac{AH}{BH} = \frac{۸}{۴} = ۲$ ($ABH \sim ABC$) (ii) (۲)

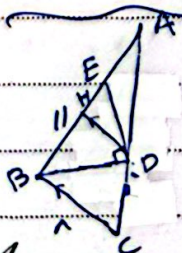


$BAF \sim ECF$ (ii) $\Rightarrow \frac{BF}{EF} = \frac{AF}{CF}$ (۵)

$\Rightarrow \frac{۶}{x} = \frac{۸+x}{۸}$ $x^۲ + ۸x = ۶۴$ (۶)

$x = ۴$

$AF = ۸ + ۴ = ۱۲$ (۱)



$ADH \sim ABC \Rightarrow \frac{AH}{AB} = \frac{HD}{BC} =$ (۴)

$EH = BH - \frac{۱۱}{۲} = y$ (۵)

$\frac{۱۱ + ۵,۵}{۱۱ + x} = \frac{۵,۵}{۸} \rightarrow x = \frac{۳۳}{۵}$

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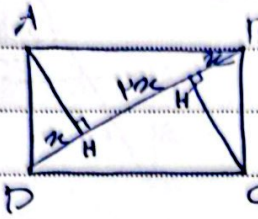
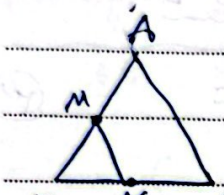


$H^2 = x \times 2x \Rightarrow H = \sqrt{2}x$ (۷)

$S_{ABD} = \frac{1}{2} S_{ABCD} = 2 \times \frac{\sqrt{2}x \times 4x}{2} = 4\sqrt{2}x^2$ (۶)

$S_{\triangle} = \frac{h \times x}{2} = \frac{\sqrt{2}x^2}{2}$

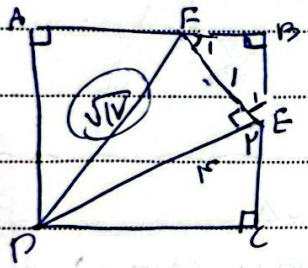
$\frac{4\sqrt{2}x^2}{\frac{\sqrt{2}x^2}{2}} = 8$ (۸)



$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{1}{2} \times AB \times BC \times \sin B}{\frac{1}{2} \times BM \times BN \times \sin B} = 4$ (۸)

(۹)

$\frac{AB}{BM} = \frac{4}{3} \rightarrow \frac{AB - BM}{BM} = \frac{1}{3} \rightarrow \frac{BM}{AM} = \frac{3}{1}$



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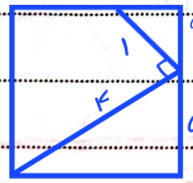

$\frac{y}{a-x} = \frac{x}{a} = \frac{1}{2} \rightarrow \begin{cases} a = 2x \\ a - x = 2y \end{cases}$

$2x - x = 2y \rightarrow x = 2y$

$2^2 = (a-x)^2 + a^2 \rightarrow x = \frac{2}{3}, a = \frac{4}{3}$

$S_{\square} = a^2 = \frac{16}{9}$

$BG = 2y, GD = y \rightarrow BD = 3y$ (۱۰)

$\begin{cases} GF = \frac{2}{3}y \\ FD = \frac{1}{3}y \end{cases} \rightarrow \frac{BD}{FD} = \frac{3y}{\frac{1}{3}y} = 9$

(۵)

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