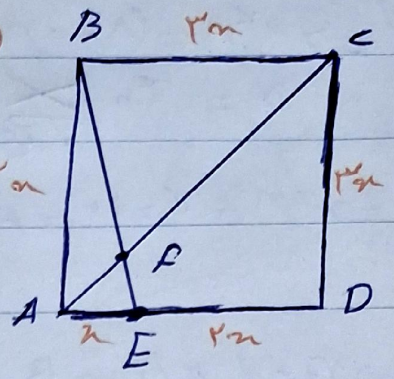
۲۵ آفرین!

* کیان جعفری *

Date Subject

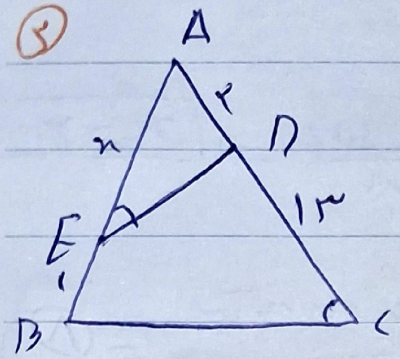
① 

$AC = 3\sqrt{2}x$ $\quad \frac{FC}{AF} = \frac{3}{1} \Rightarrow AC \times \frac{1}{4} = AF$

$\sqrt{10}x = BE$ $\quad \frac{BF}{FF} = \frac{3}{1} \Rightarrow FB \times \frac{1}{4} = FF$

(۲)

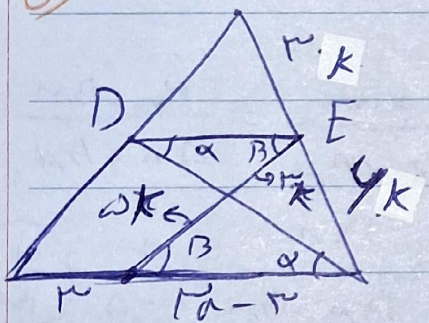
$\Rightarrow AF = \frac{3\sqrt{2}}{4}$, $FF = \frac{\sqrt{10}}{4} \Rightarrow \frac{FF}{AF} = \frac{\sqrt{5}}{3}$ ✓

② 

$\frac{AD}{AB} = \frac{ED}{BC} = \frac{AE}{AC} \Rightarrow \frac{2}{1+x} = \frac{x}{2+12}$ (۲)

$\Rightarrow \frac{2}{1+x} = \frac{x}{10} \Rightarrow 20 = x(x+1)$

$\Rightarrow \boxed{x = 4}$ ✓

③ 

$y = 5k$ $\quad \hat{D} = \hat{C}$ $\Rightarrow \triangle DEH \sim \triangle FHC$

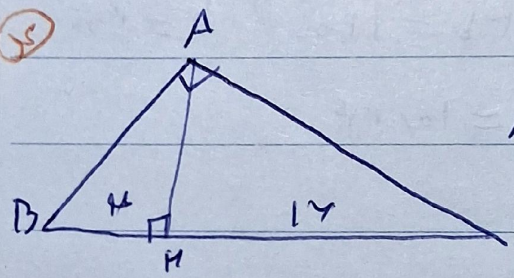
$x = 3k$ $\quad \hat{E} = \hat{F}$

(۲)

$DE = a \Rightarrow \frac{3k}{9k} = \frac{a}{BC} \Rightarrow 3a = BC$

$\frac{a}{3a-2} = \frac{2}{5} \Rightarrow 9a - 6 = 5a \Rightarrow a = \frac{9}{2}$

$\frac{9}{4} \times 3 = \frac{27}{4} = BC$ ✓

④ 

$AH = \sqrt{17 \times 3}^2 = 8$ (۲)

$AB = \sqrt{20 \times 4}^2 = 4\sqrt{5}$

$AC = \sqrt{17 \times 20}^2 = 8\sqrt{5}$

$\frac{AB}{AC} = \frac{4\sqrt{5}}{8\sqrt{5}} = \frac{1}{2}$ ✓

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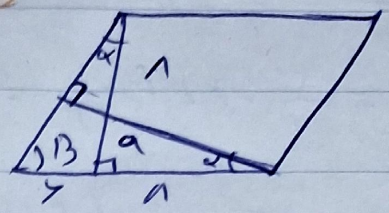

$\frac{۶}{a} = \frac{۸+a}{۸} \Rightarrow ۴۸ = (۸+a)a$ (۲)

$a = ۴, \cancel{-۱۲}$

$۸+a = AF \Rightarrow ۸+۴ = ۱۲ \neq AF$ ✓

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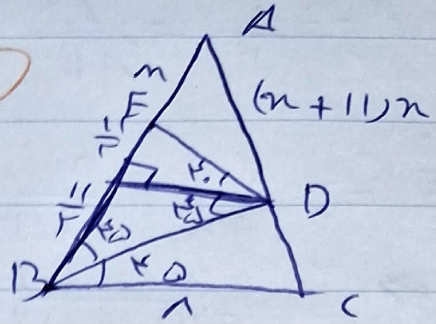

$DH \perp AB$, $BC \parallel DM \Rightarrow BC \perp AB \Rightarrow B_۱ = B_۲ = D_۱ = ۴۵$ (۲)

$\frac{x+۵(۵)}{۵\cdot۵} = \frac{x+۱۱}{۸} \Rightarrow \boxed{x = ۲\cdot۶}$ ✓

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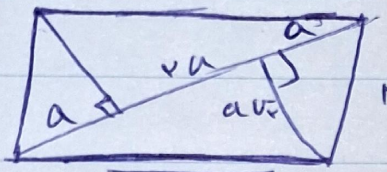

$\sqrt{۲a \times ۴a} = ۲a\sqrt{۲}$

کوچک $= \frac{۱}{۲} a \times a \times \sqrt{۲}$

بزرگ $= ۲a \times ۲a \times \sqrt{۲}$

$= \frac{۱}{۸}$ (۲)

$\Rightarrow$ (۱) ✓

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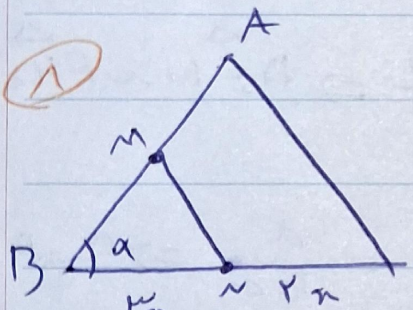
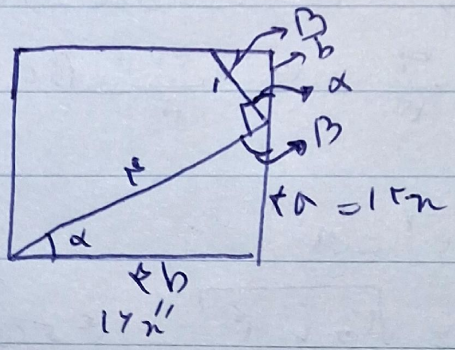


$\frac{S_{BMN}}{S_{ABC}} = \frac{\sin\alpha \times BN \times BM}{\sin\alpha \times BC \times BA} = \frac{۲x \times BM}{۵x \times BA} = \frac{۱}{۲}$

$\Rightarrow \frac{BM}{BA} = \frac{۵}{۹} \Rightarrow \frac{BM}{BA - BM} = \frac{۵}{۹-۵} = \frac{۵}{۴}$ (۲) ✓

۱۰



$۲a + b = ۲b$ $\quad a = ۲x$ (۲)

$۲a = ۲b = ۱۲x$ $\quad b = ۴x$

$S_{\square} = ۱۰/۲۴$ ✓

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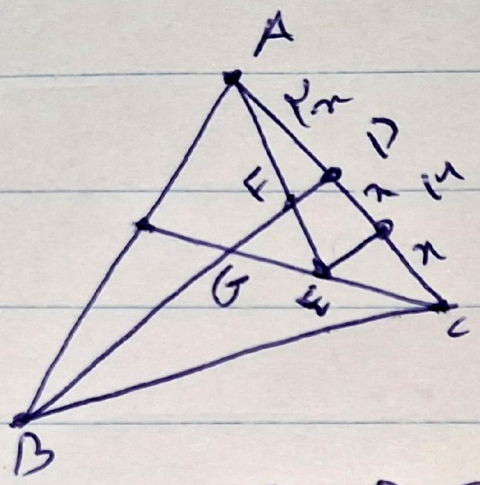

$EM \parallel FD \Rightarrow EM = 2x$, $FD = 2x$ (2)

$\Rightarrow EM = 2x \Rightarrow GD = x$

$\Rightarrow BG = 2GD$

$\Rightarrow BG = 2 \times x = 12x$

$BD = BG + GD = 12x + 2x = 14x$

$\Rightarrow \frac{BD}{FD} = \frac{14x}{2x} = 9$ ✓