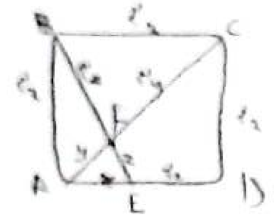
A : کلاس یازدهم — پاسخنامه تکلیف شماره ۲۱ — **۱۹**

نام و نام خانوادگی: علی ربانی

۱-



$ED = 2AE$

$\frac{AE}{BC} = \frac{AF}{FC} = \frac{EF}{FB}$

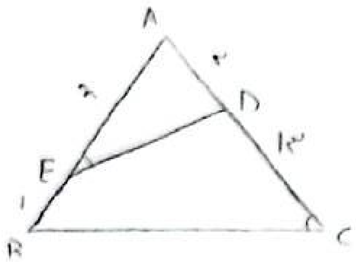
$\frac{1}{3} = \frac{AF}{FC} = \frac{EF}{FB}$

$BE^2 = (2x)^2 + x^2 \Rightarrow BE = \sqrt{10}\,x$ ... ۲

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

$\frac{EF}{AF} = ? \quad EF = \frac{BE}{4}, \quad AF = \frac{AC}{4} \Rightarrow \frac{EF}{AF} = \frac{BE}{AC} = \frac{\sqrt{10}\,x}{3\sqrt{2}\,x} = \boxed{\frac{\sqrt{5}}{3}}$ ✓

۲-



$\hat{AED} = \hat{ACB}$, $\hat{A} = \hat{A}$, $\hat{B} = \hat{D}$ $\xrightarrow{\text{ز ز}}$ $\overset{\triangle}{ADE} \sim \overset{\triangle}{ABC}$ ... **۵** ... ۲

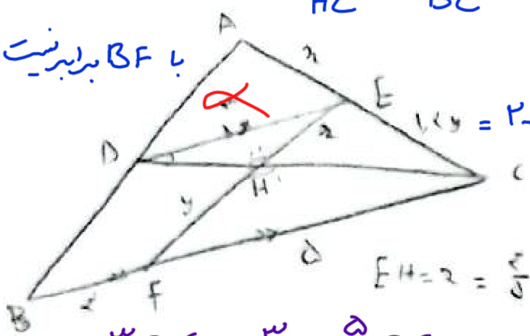
$\Rightarrow \frac{x}{15} = \frac{4}{x+1} \Rightarrow x^2 + x = 60$

$x^2 + x - 60 = 0$

$(x+8)(x-5)$ → $x = 5$ ✓, $x = -8$ ✗

$DE \parallel BC \xrightarrow{\text{جزء به کل}} \frac{AE}{AC} = \frac{DE}{BC} \to \frac{x}{3x} = \frac{DE}{BC} \to \boxed{BC = 3DE}$

۳- ... ۱



با BF برابر نیست!

$BF = 3$

$y = 5x$

$1.5y = 3x$

$H_1 = H_2$, $F = E$, $D = C$ $\xrightarrow{\text{ز ز}}$ $\overset{\triangle}{DHE} \sim \overset{\triangle}{CHF}$ ✓

$EH = x = \frac{3}{5}y$

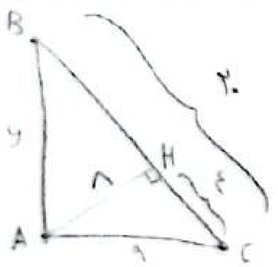
$\frac{EH}{FH} = \frac{DE}{FC} \Rightarrow \frac{\frac{3}{5}y}{y} = \frac{DE}{FC} \Rightarrow$ ~~$FC = 5$~~

$FC = \frac{5}{3}DE$

$3DE = 3 + \frac{5}{3}DE \to DE = \frac{9}{4}$

$\Rightarrow BC = BF + FC = 3 + 5 = \boxed{8}$ $\to BC = \frac{27}{4} = \boxed{6{,}75}$

۴- ... ۲



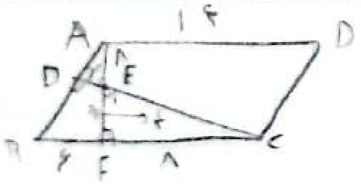
$AH^2 = 4 \cdot 16 \Rightarrow AH = 8$

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

$y^2 = 16 \times 20 \Rightarrow x = 8\sqrt{5}$

$\frac{x}{y} = \frac{4\sqrt{5}}{8\sqrt{5}} = \boxed{\frac{1}{2}}$ و $\frac{y}{x} = \boxed{2}$ ✓

۵- ... ۲



$E_1 + C = 90$, $F_1 = E_2$, $E_2 + A = 90$ $\Rightarrow A = C \Rightarrow$ $A = C$, $F = 90$ $\Rightarrow \overset{\triangle}{EFC} \sim \overset{\triangle}{ABF}$

$\frac{EF}{BF} = \frac{CF}{AF} \Rightarrow \frac{x}{6} = \frac{8}{x+8}$

$x^2 + 8x = 48$

$x^2 + 8x - 48 = 0$

$(x+12)(x-4)$

-12 ✗, $\textcircled{4}$ ✓

$CF = 14 - 6 = 8$

$AF = 8 + 4 = \boxed{12}$ ✓

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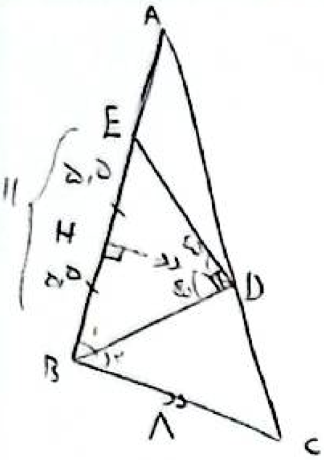
۶,۶ -۶



HD // BC ⇒ B = H = ۹۰° ⇒ B_1 = B_2 = ۴۵°

B_1 + H = ۴۵ + ۹۰ = ۱۳۵   ۱۸۰ − ۱۳۵ = ۴۵ ⇒ D_1 = ۴۵ ⇒ D_2 = ۴۵

DH² = (۵,۵)² ⇒ DH = ۵,۵

AH/AB = HD/BC = (x + ۵,۵)/(x + ۱۱) = ۵,۵/۸ ⇒ ۸x + ۴۴ = ۵,۵x + ۶۰,۵

۲,۵x = ۱۶,۵

x = ۱۶,۵/۲,۵ = ۶,۶

(۲)

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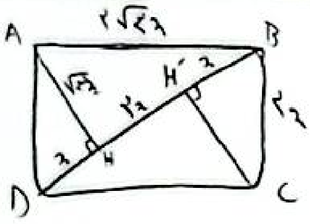
۸ -۷



AH² = ۲x² ⇒ AH = √۲x

AB² = ۴x × ۳x = ۱۲x² = ۲√۳x

BC² = x × ۴x = ۴x² = ۲x

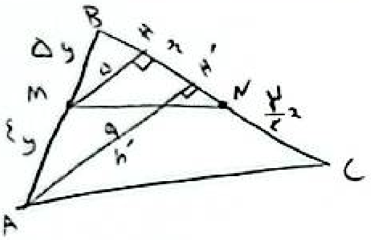
S_ABCD / S_AHD = (۲x × ۲√۳x)/((√۳/۲) x²) = ۸

S_ADH = (√۳x × x)/۲ = (√۳/۲) x²

S_AHD = S_BCH′

(۲)

-۸



BM/AM = ?

S_MBN = (h × x)/۲

S_ABC = (h′ × (۵/۲)x)/۲ ⇒ S_ABC / S_MBN = ۳/۱ = (h′ × (۵/۲)x)/(h × x) = (h′ × ۵)/(h × ۲) = ۳/۱

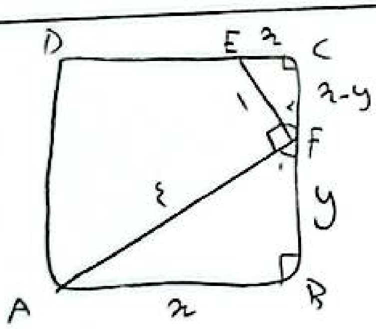
۹h = ۵h′

h/h′ = ۵/۹

BM/AB = MH/AH′ = ۵/۹ ⇒ BM/AM = ۵y/۴y = ۵/۴

(۲)

-۹



B̂ = Ĉ

F_1 = E

F_2 = A

⇒ △FCE ~ △ABF

⇒ FE/AF = CF/AB = CE/FB

۴/۱ = x/(x − y)   ۴x − ۴y = x

۳x = ۴y

(۳/۴)x = y

۴² = x² + (۹/۱۶)x²

۱۶ = (۲۵/۱۶)x² ⇒ x² = (۱۶ × ۱۶)/۲۵ = ۱۰,۲۴

S = x² =

(۲)

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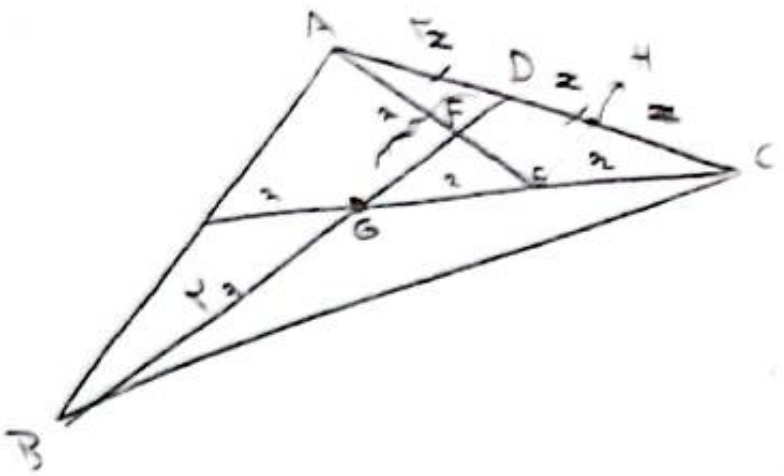

$EH \parallel GD \Rightarrow \frac{EC}{GE} = \frac{CH}{DH}$ $\xrightarrow{EC=EG}$ .1.

(۲)

$\frac{CH}{DH} = 1 \Rightarrow CH = DH$

$FD \parallel EH \rightarrow \frac{AD}{AH} = \frac{FD}{EH} = \frac{۲}{۳} = \frac{FD}{EH}$

$EH = \frac{۳}{۲} FD$

$EH \parallel DG \rightarrow \frac{CH}{CD} = \frac{EH}{GD} = \frac{۳}{۴} = \frac{EH}{GD}$

$GD = ۲EH \rightarrow GD = ۲\left(\frac{۳}{۲}FD\right) \Rightarrow GD = ۳FD$

$\frac{GD}{BD} = \frac{۱}{۲}$

$۲\frac{FD}{BD} = \frac{۱}{۲} \Rightarrow \frac{BD}{FD} = \boxed{۹}$ ✓