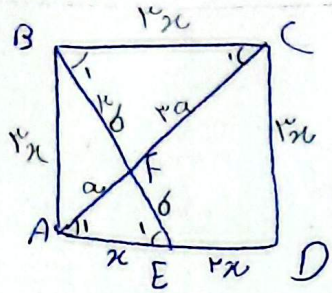
بسم رب الذی خلق الهدی

۱۸

نام و نام خانوادگی ... پاسخنامه تشریحی تکلیف شماره ۲۱ کلاس ... یازدهم ریاضی



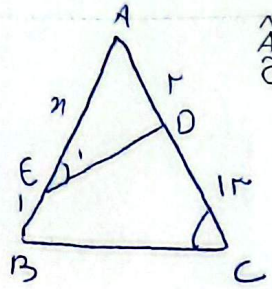
$\frac{EF}{AF} = ?$ $BC \parallel AD$ BE, AC $\Rightarrow \hat{B}_1 = \hat{E}_1$ $\hat{C}_1 = \hat{A}_1$ $\Rightarrow \triangle BCF \sim \triangle AEF$

$\rightarrow BC = 2AE \Rightarrow BF = 2FE$

$BE = 4b = x\sqrt{10} \Rightarrow b = \frac{\sqrt{10}}{4}x$ (فیثاغورس)

$AC = 4a = 3\sqrt{2}x \Rightarrow a = \frac{3}{4}\sqrt{2}x$ (فیثاغورس)

$\frac{EF}{AF} = \frac{b}{a} = \frac{\frac{\sqrt{10}}{4}x}{\frac{3}{4}\sqrt{2}x} = \frac{\sqrt{10}}{3\sqrt{2}}$ ۱

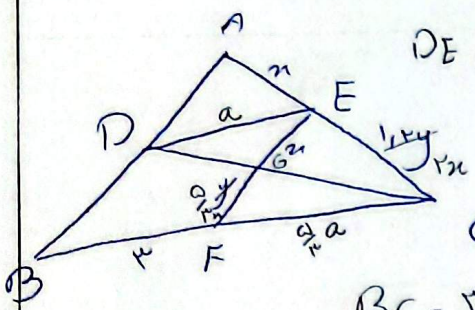


$\hat{A} = \hat{A}$, $\hat{C} = \hat{E}_1 \Rightarrow \triangle AED \sim \triangle ABC \Rightarrow \frac{x}{15} = \frac{2}{x+1}$

$x^2 + x = 30 \Rightarrow x^2 + x - 30 = 0 \quad (x+6)(x-5) = 0$

غ ق ق $x = -6$

$x = 5$



$DE \parallel BC \xrightarrow[\text{پروانه‌ای}]{\text{تالس}} \triangle DEG \sim \triangle GFC$ با نسبت تشابه $\frac{a}{\frac{9}{4}a}$

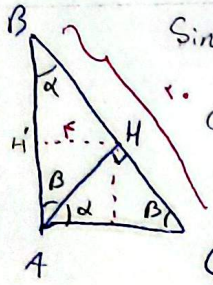
$\frac{x}{3x} = \frac{a}{3+\frac{9}{4}a} \Rightarrow 3a = 3 + \frac{9}{4}a$

$\frac{3}{4}a = 3$

$a = \frac{9}{4}$

$\frac{3}{4}a = \frac{15}{4}$

$BC = 3 + \frac{15}{4} = \frac{27}{4}$



$\sin\alpha = \frac{AH}{AB} = \frac{AC}{20} = \frac{4}{BH} = \frac{HC}{AC}$

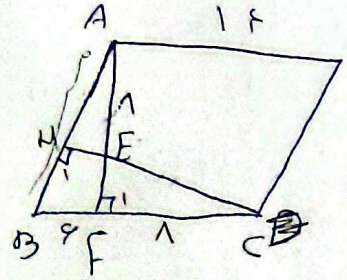
رابطه طولی $\rightarrow (AH)^2 = BH \times HC = 4AC = BH \times AC \Rightarrow BH = 8$

$HC = 14$

$\sin B = \frac{AH}{AC} = \frac{AB}{20} = \frac{4}{AH'} = \frac{BH}{AH}$

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

$(AC)^2 = 16 \times 20 \Rightarrow AC = 8\sqrt{5}$ $\Rightarrow \frac{AC}{AB} = 2$



$\triangle ABF \sim \triangle BHC$

$\hat{B} = \hat{B}, \hat{H}_1 = \hat{F}_1 = 90$

$\frac{8}{8+EF} = \frac{EF}{6} \Rightarrow EF = 4$

$AF = AE + EF = 12$

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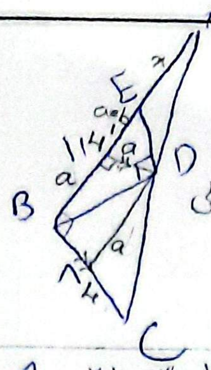


$DH = a = DH'$ خاصیت نیمساز

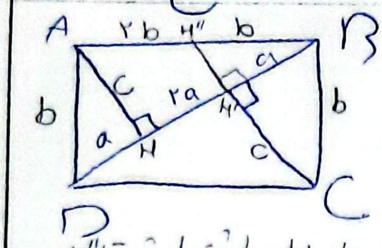
$H'DHB \Rightarrow$ ۳ زاویه قائمه و دو ضلع مجاور برابر $\Rightarrow$ مربع $\Rightarrow BH' = a$

روابط طولی $\Rightarrow a^۲ = ab \Rightarrow a = b = ۵,۵$

$\frac{x+b}{۱۱+x} = \frac{a}{۸} \Rightarrow \frac{x+۵,۵}{۱۱+x} = \frac{۵,۵}{۸} \Rightarrow ۸x + ۴۴ = ۶۰,۵ + ۵,۵x$

$۱۶,۵ = ۲,۵x$

$x = ۶,۶$



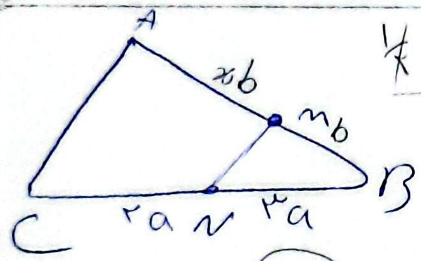
$A\hat{H}D \cong B\hat{C}H'$ وض

$S_{□} = \frac{۳ac}{۲} + \frac{ac}{۲} + \frac{۳ac}{۲} + \frac{ac}{۲} = ۴ac$

S_{Δ} هاشورخورده $= \frac{ac}{۲}$

$\frac{۴ac}{\frac{ac}{۲}} = ۸$

اگر HC ادامه داشته باشد تا H'' آن وقت $\Leftarrow$ ۲۴ برابر



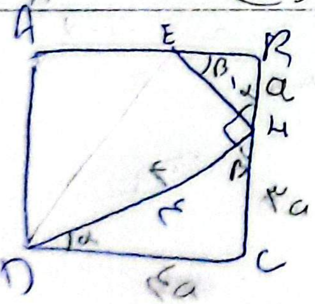
$\frac{\frac{1}{2}(x+1)b \times ۵a \times \sin B}{\frac{1}{2} b \times ۳a \times \sin B} = ۳$

$۵(x+1) = ۹$

$۵x = ۴$

$x = \frac{۴}{۵}$

$\frac{BM}{AM} = \frac{1}{x} = \frac{۵}{۴}$

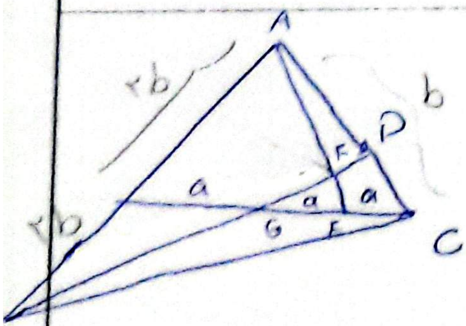


$\overset{\Delta}{BEH} \sim \overset{\Delta}{HCD}$

$\frac{۱}{۴} = \frac{BH}{HC}$

$۵a = ۴ \Rightarrow a = \frac{۴}{۵}$

$S = \frac{۱۶}{۵} \times \frac{۱۶}{۵} = ۱۰,۲۴$



$BG = ۲y , \ GD = y \rightarrow BD = ۳y$

$GF = \frac{۲}{۳}y \rightarrow \frac{BD}{FD} = \frac{۳y}{\frac{۱}{۳}y} = ۹$

$FD = \frac{۱}{۳}y$

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