

امتحان زیر خراست کاربرد هندسه

17, 175

$$AD = AE + ED, \text{ if } ED = 2m \Rightarrow AE = m \rightarrow \text{ضلع صغ} = 3m$$

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$$\triangle AFE \sim \triangle CFB, \triangle BCF \sim \triangle EAF \rightarrow \frac{AF}{CF} = \frac{AE}{CB} = \frac{EF}{BF} = \frac{1}{3} \rightarrow CF = 3AF$$

$$AC = AF + CF = AF + 3AF = 4AF \rightarrow AF = \frac{CF}{3} \Rightarrow \frac{AE}{CB} = \frac{EF}{BF} = \frac{1}{3} \rightarrow BF = 3EF$$

$$20 \text{ ضلع صغ} = 2m \rightarrow \text{ضلع کب} = 2\sqrt{2}m \rightarrow AE = \frac{AC}{4} = \frac{2\sqrt{2}m}{4}$$

$$\frac{EF}{AF} = \frac{BC}{AB}, \frac{EF}{AF} = \frac{AE}{BC}, \frac{EF}{AF} = \frac{m}{2m} = \frac{1}{2} \rightarrow \frac{\sqrt{5}}{2} = \text{جواب}$$

$$\triangle AED \sim \triangle ACB \rightarrow \frac{AD}{AB} = \frac{AE}{AC} \Rightarrow \frac{2}{n+1} = \frac{m}{10} \rightarrow m + n = 2 \rightarrow m = 1$$

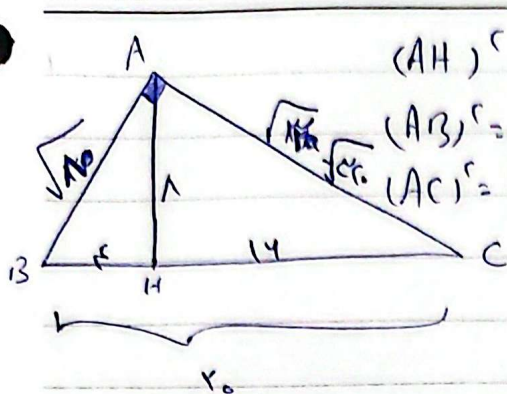
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$$xy = 2a \rightarrow \text{if } x = 2k, y = 2k \rightarrow \frac{DE}{CF} = \frac{3}{5} = \frac{2a}{5a}$$

$$\frac{DE}{BC} = \frac{DE}{BF + FC} = \frac{2a}{2 + 2a} = \frac{AE}{AC} = \frac{2k}{2k + 2k} \rightarrow \frac{2a}{2 + 2a} = \frac{2k}{4k} \rightarrow 2a = 2 + 2a$$

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$$\rightarrow 2a = 2 + 2a \rightarrow a = \frac{2}{2} = 1 \rightarrow BC = 2 + 2a = 2 + 2(1) = 4$$



$$(AH)^2 = BH \times CH \rightarrow (AH)^2 = 48 \rightarrow AH = 1$$

$$(AB)^2 = BH \times BC = 4 \times 20 = 80 \rightarrow AB = \sqrt{80}$$

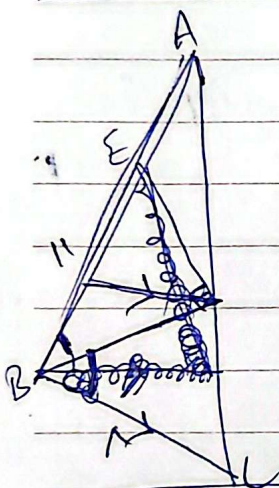
$$(AC)^2 = CH \times BC = 14 \times 20 = 280 \rightarrow AC = \sqrt{280}$$

$$\boxed{AB = \sqrt{80} \text{ و } AC = \sqrt{280}}$$

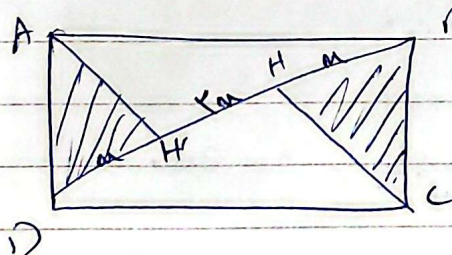
نسبت ۲

$$\triangle BAF \sim \triangle ECF \rightarrow \frac{BF}{EF} = \frac{AF}{CF}$$

$$\frac{4}{m} = \frac{1+m}{1} \rightarrow m^2 + 1m = 4 \rightarrow m = 4 \rightarrow \boxed{AF = 1+4 = 5}$$



$$\frac{4}{5} = \frac{AE}{EB} = \frac{AE}{11} \rightarrow \frac{4 \times 11}{5} = \boxed{AE = 8.8}$$

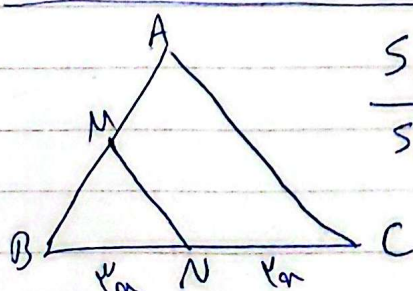


$$h^2 = m \times n \rightarrow h = \sqrt{mn}$$

$$S_{\square} = 2 \times S_{\triangle ABD} = 2 \times \frac{1}{2} \times \sqrt{mn} \times \sqrt{mn} = \sqrt{mn} \times \sqrt{mn} = mn$$

$$S_{\text{مربع}} = \frac{h \times m}{2} = \frac{m^2 \sqrt{m}}{2}$$

$$\frac{I}{II} = \frac{\frac{1}{2} \times \sqrt{mn} \times m}{\frac{1}{2} \times m^2 \sqrt{m}} = \boxed{1}$$



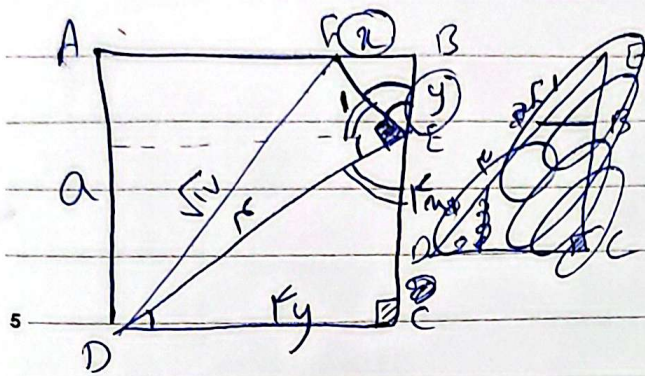
$$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \times BN}{BA \times BC} = \frac{MB}{AB} \times \frac{1}{2} = \frac{1}{4}$$

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

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$$\triangle EDB \sim \triangle EAC$$

(2) (4)

$$\rightarrow \frac{EB}{EA} = \frac{ED}{EC} \rightarrow \frac{EB}{EA} = \frac{ED}{EC}$$

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$$\text{Solve} = \frac{152}{10}$$

(15)

$$\overline{AB} \perp \overline{CD} \rightarrow \triangle AGD \rightarrow \text{مستطیل متشابه}$$

$$\hat{A} \rightarrow \hat{A} \rightarrow \angle EAC = \alpha$$

$$G \rightarrow BG = 2n \quad GD = n \rightarrow BD = 3n$$

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از A به G وصل کنیم، AE، GD، AC مستطیل متشابه

$$GF = \frac{2}{3}n$$

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

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