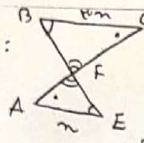


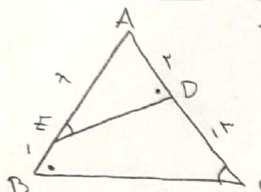
$$\frac{EF}{AF} = ?$$


$$\triangle BCF \cong \triangle AEF \Rightarrow \frac{BC}{AE} = \frac{FC}{AF} = \frac{BF}{EF} \Rightarrow \frac{2}{1} = \frac{FC}{2} = \frac{BF}{1}$$

$$\Rightarrow FC = 2AF \Rightarrow AC = AF + FC = (AF = \sqrt{2}) \Rightarrow AF = \frac{\sqrt{2}}{2}$$

$$\Rightarrow \frac{EF}{AF} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = \frac{\sqrt{2}}{2}$$

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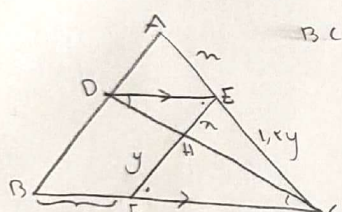


$$\triangle ADE \cong \triangle ABC: \frac{AD}{AB} = \frac{AE}{AC} = \frac{ED}{BC} \Rightarrow \frac{2}{n+1} = \frac{n}{10} = \frac{ED}{BC}$$

$$\Rightarrow n^2 + n = 2 \Rightarrow n^2 + n - 2 = 0 \Rightarrow (n-1)(n+2) = 0$$

$$n = 1 \text{ (طول ضلع!)} \Rightarrow \frac{EF}{AF} = \frac{\sqrt{2}}{2}$$

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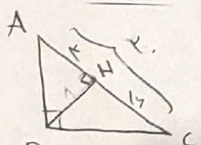


$$\triangle DEH \cong \triangle FCH: \frac{DE}{FC} = \frac{EH}{FH} = \frac{DH}{CH} \Rightarrow \frac{DE}{FC} = \frac{x}{y} = \frac{DE}{FC}$$

$$\frac{AE}{AC} = \frac{DE}{BC} \Rightarrow \frac{n}{n+1+y} = \frac{DE}{n+FC} \Rightarrow \frac{n}{n+(1+\frac{1}{2})n} = \frac{n}{2n} = \frac{1}{2} = \frac{DE}{n+FC}$$

$$\Rightarrow FC + n = 2DE: DE = \frac{1}{2} FC \Rightarrow FC + n = \frac{1}{2} FC \Rightarrow FC(\frac{1}{2} - 1) = -n \Rightarrow FC = \frac{n}{\frac{1}{2}} = 2n = 2, 10$$

۳

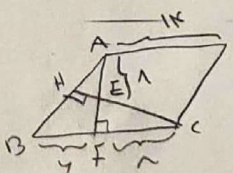


$$BC^2 = HC \times AC \Rightarrow BC^2 = 14 \times 2 \Rightarrow BC = \sqrt{28} = 2\sqrt{7}$$

$$AB^2 = AH \times AC \Rightarrow AB^2 = 4 \times 2 \Rightarrow AB = \sqrt{8} = 2\sqrt{2}$$

$$\Rightarrow \frac{AB}{BC} = \frac{2\sqrt{2}}{2\sqrt{7}} = \frac{1}{\sqrt{2}}$$

۴

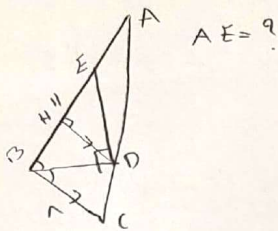


$$\triangle ABF \cong \triangle FCE \Rightarrow \frac{AB}{EC} = \frac{BF}{FE} = \frac{AF}{FC} \Rightarrow \frac{4}{1+FE} = \frac{1}{FE}$$

$$\Rightarrow 4FE = 1 + FE \Rightarrow 3FE = 1 \Rightarrow FE = \frac{1}{3}$$

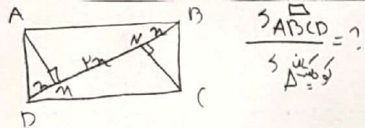
$$\Rightarrow AF = AE + EF = 1$$

۵



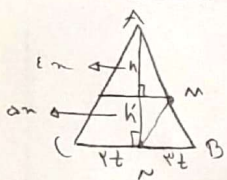
$$AE = 9$$

6
?



$$\frac{S_{ABCD}}{S_{\triangle ABC}} = ?$$

7
?

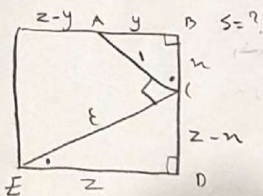


$$\frac{S_{ABC}}{S_{BMN}} = ? \rightarrow \frac{\frac{1}{2} \times BC \times (h+h')}{\frac{1}{2} \times \cancel{BC} \times (h')} = ? = \frac{a(h+h')}{ah+ah'} = 9h' \rightarrow ah = 9h'$$

$$\frac{BM}{AM} = ?$$

$$\frac{h}{h'} = \frac{AM}{BM} \Rightarrow \frac{BM}{AM} = \frac{h'}{h} = \frac{a}{9} = 1,2$$

8



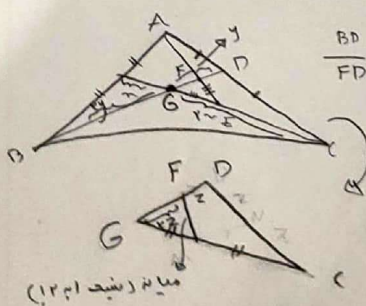
$$\triangle ABC \cong \triangle CDE \Rightarrow \frac{AB}{DC} = \frac{AC}{EC} = \frac{BC}{ED} \Rightarrow \frac{y}{z-n} = \frac{1}{8} = \frac{n}{z} \rightarrow \underline{zn = z}$$

$$\Rightarrow \frac{y}{zn} = \frac{1}{8} \rightarrow y = \frac{zn}{8}$$

$$(منكوبات) : n^2 + y^2 = 1 \Rightarrow n^2 + \frac{9}{16} n^2 = 1 \Rightarrow n^2 = \frac{1 \times 16}{25} = \frac{16}{25} \Rightarrow n = \frac{4}{5}, y = \frac{3}{5}$$

$$(منكوبات) : (z-n)^2 + z^2 = 17 \Rightarrow \sqrt{z^2 - \frac{16}{5}z + \frac{16}{5}} + z^2 = 17 \rightarrow$$

9
?



$$\frac{BD}{FD} = ?$$

نقطه G مرکز ثقل است!

در این مسئله ما باید نسبت را پیدا کنیم و باید نسبت را پیدا کنیم و باید نسبت را پیدا کنیم

$$\Rightarrow y = 12 \rightarrow 12y = 12z \Rightarrow \frac{BD}{FD} = \frac{12z + 12z}{z} = 24$$

10