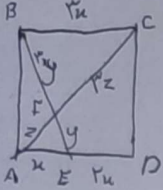


$$BFC \sim AFE \Rightarrow \frac{BF}{FE} = \frac{CF}{AF} = 3 \rightarrow \frac{BAE}{(fy)^r} = 3+1 \Rightarrow y = \frac{\sqrt{10}}{E}$$



$$\rightarrow AC = 3x\sqrt{2} = 5x \rightarrow x = \frac{3\sqrt{2}}{5} \Rightarrow \frac{y}{z} = \frac{\frac{\sqrt{10}}{E}}{\frac{3\sqrt{2}}{5}} = \frac{\sqrt{5}}{3} \checkmark$$

(۲)

۱

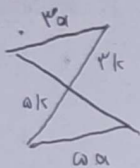
$$AED \sim ACB \rightarrow \frac{AD}{AB} = \frac{AE}{AC} \Rightarrow \frac{r}{k+1} = \frac{k}{10} \Rightarrow k+r = 10 \rightarrow k \begin{cases} \omega \checkmark \\ -4 \text{ و } 6 \end{cases}$$

(۲)

۲

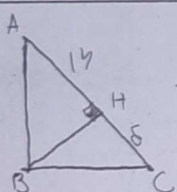
$$k = 3k \xrightarrow{\text{مثلا}} \frac{3\alpha}{3+\omega\alpha} = \frac{3/k}{9/k} = \frac{1}{3} \rightarrow \alpha = 1/\sqrt{3} \rightarrow BC = 3+\omega (1/\sqrt{3}) = 4/\sqrt{3} \checkmark$$

$$y = \omega/k$$



(۲)

۳



$$\begin{aligned} (AB)^r &= 14 \times 20 \rightarrow AB = 14\sqrt{5} \\ (BC)^r &= 8 \times 20 \rightarrow BC = 8\sqrt{5} \Rightarrow \frac{14\sqrt{5}}{8\sqrt{5}} = 7/4 \checkmark \end{aligned}$$

(۲)

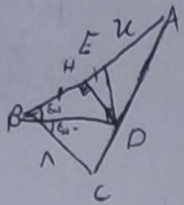
۴

$$ABF \sim EFC \rightarrow \frac{CF}{AF} = \frac{EF}{BF} \Rightarrow \frac{\lambda}{\lambda+EF} = \frac{EF}{4} \rightarrow (EF)^r + \lambda(EF) - f\lambda = 0 \rightarrow EF \begin{cases} \varepsilon \checkmark \\ -12 \text{ و } 12 \end{cases}$$

$$AF = x + \lambda = f + \lambda = 12 \checkmark$$

(۲)

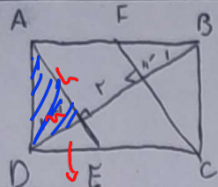
۵



$$DH=BH=EH=\frac{11}{2} \xrightarrow{\text{قوله}} \frac{AH}{AB} = \frac{DH}{BC} \Rightarrow \frac{x+\frac{11}{2}}{x+11} = \frac{\frac{11}{2}}{11} \Rightarrow x=\frac{11}{2} \checkmark$$

(2)

6



$$AH^2 = x^2 \rightarrow AH = \sqrt{x}, AD^2 = (\sqrt{x})^2 + 1^2 \rightarrow AD = 2 \rightarrow E = \sqrt{x} + AIB \rightarrow AB = \sqrt{x}$$

$$AHB \sim DHE \rightarrow \frac{AH}{DH} = \frac{AB}{DE} = \frac{HB}{DH} \rightarrow \frac{\sqrt{x}}{HE} = \frac{\sqrt{x}}{DE} = \frac{1}{1} \Rightarrow HE = \frac{\sqrt{x}}{2}$$

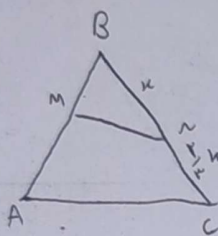
بالوجه به تقاطعات سوال
تشکیل شده

$$\frac{S_{\text{مربع}}}{S_{\text{مربع کوچک}}} = \frac{2\sqrt{x} \times 2}{\frac{1}{2} \times \frac{\sqrt{x}}{2} \times 1} = \frac{4}{\frac{\sqrt{x}}{4}} = \frac{16}{\sqrt{x}} \quad \boxed{1}$$

$$S_{\text{مربع کوچک}} = \frac{h \times r}{2} = \frac{\sqrt{x} \times r}{2}$$

(1,5)

7

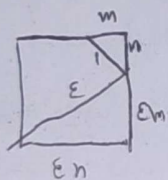


$$S_{ABC} = 3S_{BMN} \rightarrow \frac{1}{2} AB \times \frac{\omega}{2} \times \sin B = 3 \times \frac{1}{2} BM \times \frac{\omega}{2} \times \sin B$$

$$\rightarrow \frac{BM}{AB} = \frac{\omega}{9} \rightarrow \frac{BM}{AM} = \frac{\omega}{8} \checkmark$$

(2)

8



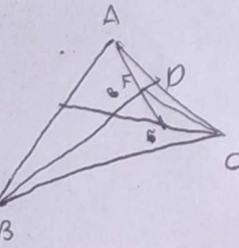
$$Em + n = En \rightarrow Em = En$$

$$(En)^2 + (Em)^2 = E^2 \rightarrow m^2 + n^2 = 1 \rightarrow \left(\frac{m}{E}\right)^2 + n^2 = 1 \rightarrow n^2 = \frac{14}{105}$$

$$S = 14 \times \frac{14}{105} = 10,28 \checkmark$$

(2)

9



$$\frac{BG}{GD} = \frac{r}{r} \Rightarrow GFE \sim CFE \rightarrow GF = FC$$

$$\hookrightarrow GD = \frac{1}{2} BD \quad FD = \frac{1}{2} GD \rightarrow FD = \frac{1}{4} BD$$

$$\frac{BD}{FD} = \frac{4}{1}$$

$$\text{محله بر محور میانه ها} \quad G \rightarrow BG = 2n \quad GD = n \rightarrow BD = 3n$$

(1,5)

10

از A به G وصل کنیم، AE، GD، میانه ها مثلث AGC هستند:

$$GF = \frac{2}{3} n \rightarrow \frac{BD}{FD} = \frac{3n}{\frac{1}{3} n} = \boxed{9}$$