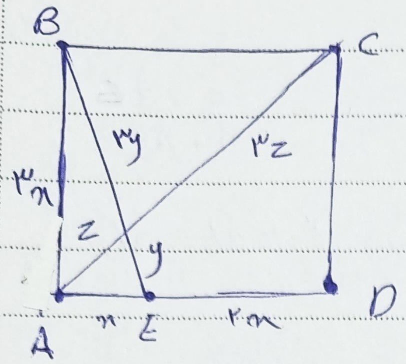
Subject:
Year: Month: Day:



① $BE = \sqrt{10}\,x$, $AC = 3\sqrt{2}\,x$

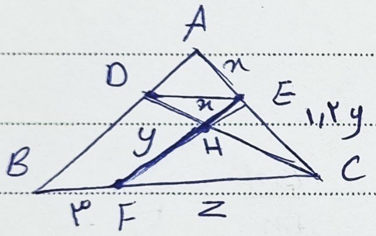
$4z = 3\sqrt{2}\,x \rightarrow z = \frac{3\sqrt{2}\,x}{4}$, $4y = \sqrt{10}\,x$

$\rightarrow y = \frac{\sqrt{10}\,x}{4}$

$$\frac{EF}{AF} = \frac{\frac{\sqrt{10}\,x}{4}}{\frac{3\sqrt{2}\,x}{4}} = \frac{\sqrt{10}}{3\sqrt{2}} \times \frac{3\sqrt{2}}{3\sqrt{2}} = \frac{\sqrt{5}}{3}$$

②
$$\left.\begin{aligned} \hat{A} &= \hat{A} \\ \hat{E} &= \hat{C} \\ \hat{D} &= \hat{B} \end{aligned}\right\} \rightarrow \overset{\triangle}{AED} \sim \overset{\triangle}{ABC} \rightarrow \frac{2}{x+1} = \frac{ED}{BC} = \frac{x}{15} \rightarrow x^2 + x = 30 \rightarrow$$

$\boxed{x = 5}$ ✓ $x = -6$ ✗

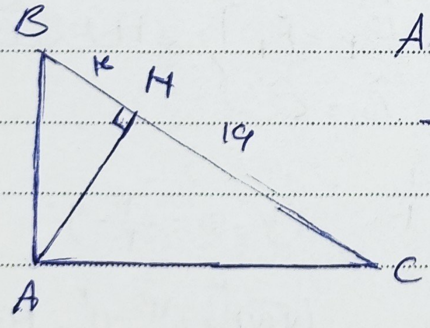


③ $3y = 5x \rightarrow \frac{x}{y} = \frac{3}{5} \rightarrow \frac{DE}{z} = \frac{3}{5}$

$$\frac{DE}{BC} = \frac{AE}{AC} \rightarrow \frac{\frac{3}{5}z}{3+z} = \frac{x}{x+1.2y} \rightarrow \frac{3z}{15+5z} = \frac{1}{3}$$

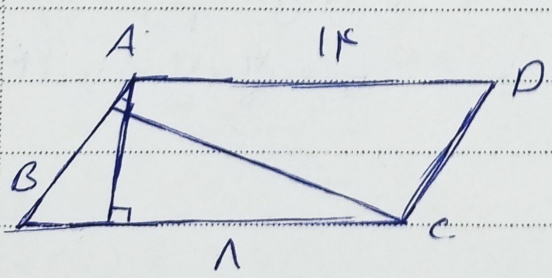
$\rightarrow z = 3.75 \rightarrow$

$BC = 3 + 3.75 = \boxed{6.75}$



④ $AH^2 = BH \times CH \rightarrow AH = 8$, $\overset{\triangle}{ABH} \sim \overset{\triangle}{ABC} \rightarrow$

$$\frac{AC}{AB} = \frac{AH}{BH} = \frac{8}{4} = 2$$



⑤ $\overset{\triangle}{BAF} \sim \overset{\triangle}{ECF} \rightarrow \frac{BF}{EF} = \frac{AF}{CF} \rightarrow$

$$\frac{6}{x} = \frac{8+x}{8} \rightarrow x^2 + 8x = 48 \rightarrow x = 4$$

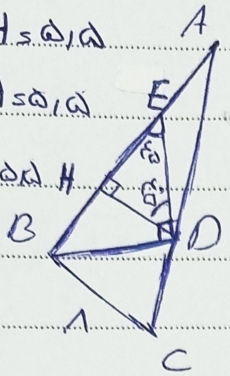
$AF = 8 + x = 12$

6

$EH = 5.5$

$DH = 5.5$

$HB = 5.5$



$$\overset{\triangle}{AHD} \sim \overset{\triangle}{ABC} \rightarrow \frac{AH}{AB} = \frac{HD}{BC} = \frac{5.5}{8} = \frac{6.5 + AE}{11 + AE}$$

$$44 + 8AE = 5.5AE + 60.5 \longrightarrow 2.5AE = 16.5 \rightarrow$$

$$AE = 6.6$$

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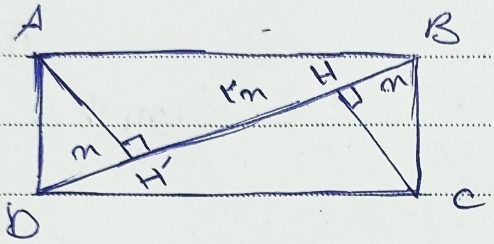


$$AH' = x \times 3x \rightarrow AH' = x\sqrt{3}$$

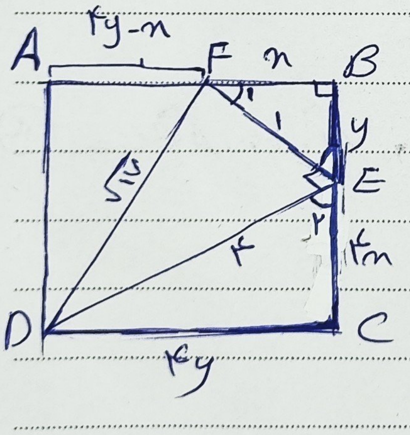
$$S_{\square} = 2 \times \frac{x\sqrt{3} \times 4x}{2} = \sqrt{3}x \times 4x = 4\sqrt{3}x^2$$

$$\longrightarrow S_{\triangle} = \frac{\sqrt{3}x^2}{2} \rightarrow \frac{S_{\square}}{S_{\triangle}} = \frac{4\sqrt{3}x^2}{\frac{\sqrt{3}x^2}{2}} = 8$$

1

$$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \times BN}{BA \times BC} = \frac{BM}{AB} \times \frac{3}{5} = \frac{1}{3} \rightarrow \frac{BM}{AB} = \frac{5}{9} \rightarrow \frac{BM}{AM} = \frac{5}{4}$$

4



$$\left.\begin{array}{l} 90 + F_1 = 90 + E_2 \rightarrow \hat{E}_2 = \hat{F}_1 \\ \hat{B} = \hat{C} \end{array}\right\} \rightarrow \overset{\triangle}{FBE} \sim \overset{\triangle}{DCE}$$

$$\rightarrow \frac{FE}{DE} = \frac{FB}{EC} = \frac{BE}{DC} = \frac{1}{4} \qquad 4y - x = \frac{13}{4}y$$

$$4x + y = 4y \rightarrow x = \frac{3}{4}y \rightarrow (\sqrt{17})^2 = \left(\frac{13}{4}y\right)^2 + 4y^2$$

$$\longrightarrow y = \frac{8}{10}, \quad DC = 4 \times \frac{8}{10} = \frac{16}{5} \longrightarrow S_{\square} = \frac{16}{5} \times \frac{16}{5} = 10.24$$

$AD = 2x \;,\; DM = x \;,\; MC = x \rightarrow EM \parallel GD \rightarrow \dfrac{EC}{EG} = \dfrac{CM}{DM} = 1 \rightarrow$ 10

$CM = DM = x \longrightarrow AD = 2x$

$$FD \parallel EM \rightarrow \frac{AD}{AM} = \frac{FD}{EM} = \frac{2x}{3x} = \frac{FD}{EM} \rightarrow EM = \frac{3}{2} FD$$

$$EM \parallel DG \rightarrow \frac{CM}{CD} = \frac{EM}{GD} = \frac{x}{2x} = \frac{EM}{GD} \rightarrow GD = 2EM \rightarrow GD = 3FD$$

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