

سوال (۱)

$$\triangle AFE \sim \triangle BFC \quad \frac{AE}{BC} = \frac{EF}{BF} = \frac{AF}{FC} = \frac{1}{2}$$

$$BE = \sqrt{3^2 + 4^2} = 5 \quad \frac{FE}{BF} = \frac{1}{2} \rightarrow \frac{FE}{BE} = \frac{1}{3}$$

$$\frac{AF}{FC} = \frac{1}{2} \rightarrow \frac{AF}{AC} = \frac{1}{3} \quad AF = \frac{2\sqrt{5}}{3}$$

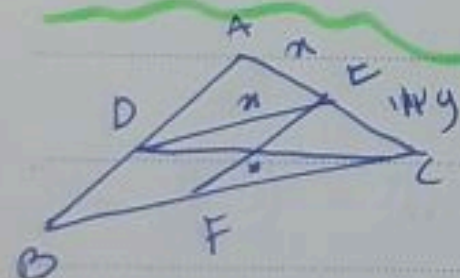
$$\frac{EF}{AF} = \frac{\frac{\sqrt{5}}{3}}{\frac{2\sqrt{5}}{3}} = \frac{1}{2} \quad \star \rightarrow FE = \frac{\sqrt{5}}{2}$$

$$\triangle AED \sim \triangle ABC \quad \frac{ED}{BC} = \frac{AD}{AB} = \frac{AE}{AC}$$

سوال (۲)

$$\frac{2}{x+1} = \frac{x}{5} \quad x^2 + x = 10 \rightarrow x^2 + x - 10 = 0$$

$$(x+5)(x-2) = 0 \quad x = -5 \text{ or } x = 2$$



$$x/y = 3/5 \quad \triangle DHE \sim \triangle FHC$$

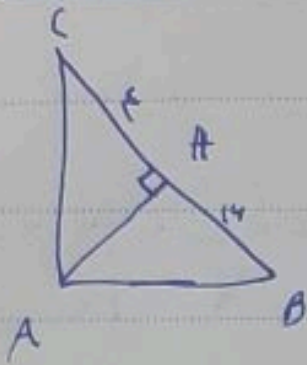
سوال (۳)

$$\frac{DE}{FC} = \frac{3}{5}$$

$$DE \parallel BC \rightarrow \frac{AE}{AC} = \frac{DE}{BC} = \frac{3}{5}$$

$$x = \frac{3}{5} \cdot 5 = 3$$

$$99 = 0.99 \Rightarrow x = \frac{3}{5} \rightarrow BC = 0.99 \cdot \frac{5}{3} = \frac{99}{100}$$



$$BC = 10$$

$$AC^2 = 4x^2$$

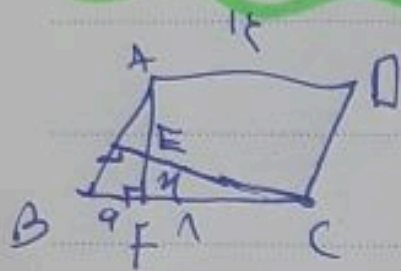
$$AC = 2\sqrt{x}$$

$$AB^2 = 14x^2$$

$$AB = 1\sqrt{14}$$

سوال (4)

$$\frac{AB}{AC} = \frac{1\sqrt{14}}{2\sqrt{x}} = 2$$



$$ABF \sim EFC$$

$$\frac{AE}{AF} = \frac{EC}{AF} = \frac{9}{y}$$

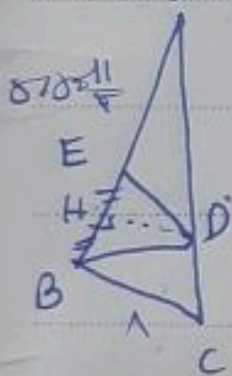
$$EF = 12 \rightarrow x^2 + 144 = y^2 \rightarrow (x+y)(x-y) = 0$$

$$AF = 12 \rightarrow x = 12$$

سوال (5)

$$DH \parallel BC$$

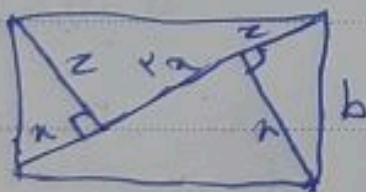
سوال (6)



$$\frac{AD}{DH} = \frac{AC}{BC} = \frac{9}{11}$$

$$EF + 11 = 9 \cdot 10 + 0 \cdot 10$$

$$11 \cdot 10 = 9 \cdot 10 \rightarrow 11 = 9$$



$$a^2 + 4a^2 + z^2 \rightarrow a^2 + 16a^2$$

$$a = 2\sqrt{5}a$$

$$b^2 = a^2 + z^2 \rightarrow b^2 = 5a^2 \Rightarrow b = \sqrt{5}a$$

$$z = \sqrt{5}a$$

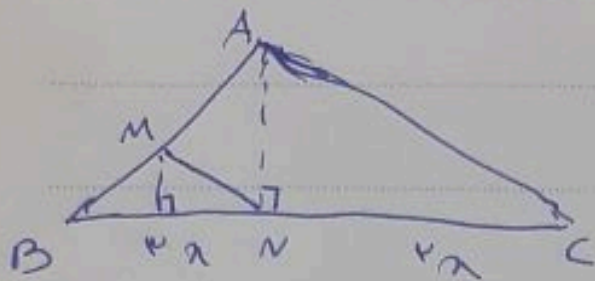
$$a^2 + b^2 = 14a^2$$

$$1a^2 + z^2 + a^2 + 2z^2 = 14a^2 \rightarrow z^2 = 13a^2$$

$$z = \sqrt{13}a$$

$$\frac{S_{\triangle}}{ab} = \frac{a \cdot b}{\frac{1}{2} \times \sqrt{5}a} = \frac{2\sqrt{5}a + 2a}{\frac{1}{2} \times \sqrt{5}a} = 1$$

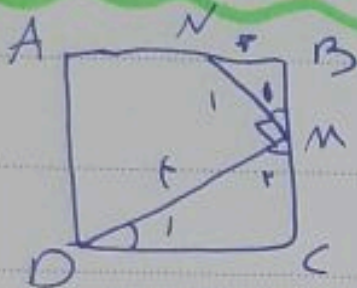
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$$\frac{S_{ABC}}{S_{BMN}} = \frac{h_1 \times 2x}{h_1 \times x} = 2 \quad \text{--- (1)} \\ \Rightarrow h_1 = 9h$$

$$h_1 \parallel h \Rightarrow \frac{h_1}{h} = \frac{BM}{AB} = \frac{9}{1} \rightarrow \frac{AM}{AB} = \frac{1}{9}$$

$$\frac{\frac{BM}{AB}}{\frac{AM}{AB}} = \frac{BM}{AM} = \frac{9}{1}$$



$$\left. \begin{aligned} M_1 + M_2 &= 9.7 \\ M_2 + D_1 &= 9. \end{aligned} \right\} D_1 = M_1$$

(9 سوال)

$\Delta DCM \sim \Delta BMN$

$$BM \perp CD$$

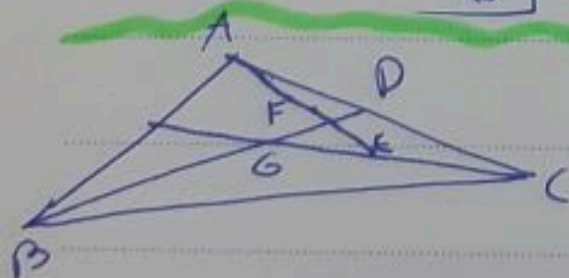
$$\frac{CD}{MB} = \frac{MC}{BN} = \frac{MD}{NK} = 9$$

$$MC = \frac{1}{9} CD \rightarrow \left(\frac{1}{9} CD\right)^2 + (CD)^2 = 14$$

$$\frac{1}{81} CD^2 + CD^2 = 14 \rightarrow CD = 14$$

$$S = (CD)^2 = \frac{196}{81}$$

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$$GD = \frac{1}{9} BD \quad \text{--- (10 سوال)}$$

$$FD = \frac{1}{9} DG \rightarrow FD = \frac{1}{9} BD$$

$$\frac{BD}{FD} = 9$$