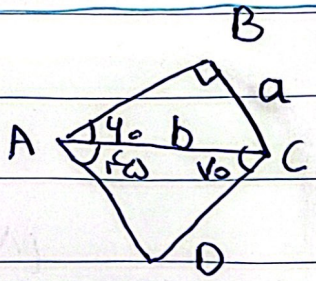
$B+C=120 \rightarrow A=60$ قضیه سینوس $\rightarrow \frac{b}{\sin B}=\frac{a}{\sin A} \rightarrow$ (۱)

$\frac{2\sqrt{6}}{\sin B}=\frac{2\sqrt{3}}{\sin 60} \rightarrow \sin B=\frac{\sqrt{2}}{2}$ $\Big\}$ $B=45$ (۲)

$45+x=120$ ✓

$75=C$ ✓

$B=45$ ✓



$b \rightarrow \frac{DC}{\sin A}=\frac{AC}{\sin D} \rightarrow \frac{2\sqrt{2}}{\frac{\sqrt{3}}{2}}=\frac{b}{\frac{\sqrt{2}}{2}} \rightarrow b=2\sqrt{2}$ (۲) (۱)

مثلث ABC $\rightarrow \sin 60=\frac{a}{b} \rightarrow a=3$ (۱)

$\frac{c}{\sin C}=\frac{b}{\sin B} \rightarrow \frac{\sin C}{\sin B}=\frac{c}{b} \xrightarrow{\times(b^2-2)} \frac{\sin C}{\sin B}=\frac{c}{b}(b^2-2)$ (۳)

$\frac{c}{b} \times b^2-2=c$ (۲)

$b^2-b-2=0 \rightarrow b=-1$ ✗

$b=2$ ✓

$\frac{b}{\cos}$ $\rightarrow b^2=a^2+c^2-2ac\cos B \Rightarrow 14=4+6-2(2)(\cos B)$ (۲)

$\cos B=0.8$ ✓ $\rightarrow \sin B=0.6$ ✓ (۲)

(۵) الف)

$a^2=14+14+8\sqrt{3}-8-8\sqrt{3}=36 \rightarrow a=\frac{6}{2\sqrt{6}}$ ✓

ب)

$\frac{c}{\sin B}=\frac{2(1+\sqrt{3})}{\sin C}=\frac{2\sqrt{6}}{\frac{\sqrt{3}}{2}}=4\sqrt{2} \Rightarrow \sin B=\frac{\sqrt{2}}{2}$ (۲)

$B=45$ ✓ $C=75$ ✓

(۶

$ABC \xrightarrow{\text{cos ها}} a^2 = b^2 + c^2 - 2bc\cos\alpha \rightarrow 4 = 5 - 4\cos\alpha$ ، $\cos\alpha \to \frac{1}{4}$

۲

$ADE \rightarrow DE^2 = 36 + 16 - 48\cos\alpha \rightarrow DE = \sqrt{40}$ ، $\cos\alpha = \frac{1}{4}$

(۷

الف) $BC = \sqrt{64 + 25 - 80 \times \frac{1}{2}} = 7$ ، $64 + 25 = 89$ ، $80 \times \frac{1}{2} = 40$

۲

ب) $S = \frac{1}{2} \times 8 \times 5 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$

(۸

$$\frac{b^2 + c^2 + 2bc - (b^2 + c^2 - 2bc\cos A)}{bc(\cos A + 1)} = \frac{2bc(1 + \cos A)}{bc(1 + \cos A)} = 2$$

$(b^2 + c^2 - 2bc\cos A)$: قانون cosها (a^2)

۲

(۹

$b^3 + a^3 - c^3 = a^3 + a^2b - a^2c \rightarrow (b - c)(b^2 + bc + c^2)$

۲

$\rightarrow a^2(b - c) = (b - c)(b^2 + bc + c^2) \xrightarrow{\text{قانون cos ها}} \cos A = -\frac{1}{2}$ ، $a^2 = b^2 + bc + c^2$ ، $bc = -2bc\cos A$

$\hat{A} = 120^\circ$

(۱۰

$\frac{1}{4} \times (3 - \cos\theta) \times (1 + \cos\theta) = 2$

$-3\cos^2\theta + 8\cos\theta + 3 = 8 \rightarrow 3\cos^2\theta - \cos\theta \times 2 + 5 = 0$

۲

$\cos\theta = 1$ یا $\cos\theta = \frac{5}{3}$ (غ‌ق‌ق)

$a^2 = 4 + 16 - 16\frac{\sqrt{3}}{2} = 20 - 8\sqrt{3}$

s.a.m