

الف) $(\sin 15^\circ + \sin 30^\circ)(\cos 15^\circ - \cos 15^\circ) = \left(\frac{\sqrt{2}}{4} + \frac{\sqrt{3}}{4}\right)\left(-\frac{\sqrt{2}}{4} + \frac{\sqrt{3}}{4}\right) = \left(\frac{\sqrt{3}}{4}\right)^2 - \left(\frac{\sqrt{2}}{4}\right)^2 = \frac{3}{16} - \frac{2}{16} = \frac{1}{16}$
 ب) $\frac{1 + 2 \tan^2 45^\circ}{1 + 2 \cos^2 30^\circ + 2 \cos^2 45^\circ} = \frac{1 + 2\left(\frac{\sqrt{3}}{2}\right)^2}{1 + 2\left(\frac{\sqrt{3}}{2}\right)^2 + 2\left(\frac{1}{2}\right)^2} = \frac{1+3}{3+1} = \frac{4}{4} = 1$

الف) $\sin 45^\circ = \frac{\sqrt{2}}{2}$ $\sin = \frac{\text{مقابل}}{\text{وتر}}$ $\frac{\sqrt{2}}{2} = \frac{AH}{\sqrt{4}} \rightarrow AH = \sqrt{2}$

$CH = (\sqrt{2})^2 - (\sqrt{2})^2 = 12 - 3 = 9 \xrightarrow{\text{جذر}} \sqrt{9} = 3$

ب) $\cos 30^\circ = \frac{\sqrt{3}}{2}$ $\cos = \frac{\text{مجاور}}{\text{وتر}}$ $\frac{\sqrt{3}}{2} = \frac{9}{AC} \rightarrow AC = \frac{18}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{18\sqrt{3}}{3} = 6\sqrt{3}$

$AH = (6\sqrt{3})^2 - 9^2 = 108 - 81 = 27 \xrightarrow{\text{جذر}} \sqrt{27} = 3\sqrt{3}$

$\sin = \frac{\text{مقابل}}{\text{وتر}} \rightarrow \sin = \frac{3\sqrt{3}}{6\sqrt{3}} = \sqrt{\frac{3}{4}} = \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2} \rightarrow \theta = 45^\circ$

الف) $\sin = \frac{\text{مقابل}}{\text{وتر}}$ $\sin 40^\circ = \frac{\sqrt{3}}{2}$ $\frac{\sqrt{3}}{2} = \frac{50\sqrt{3}}{AD} \rightarrow AD = 100$

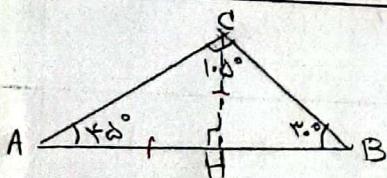
$BD = 100^2 - (50\sqrt{3})^2 = 10000 - 7500 = 2500 \xrightarrow{\text{جذر}} \sqrt{2500} = 50$

$\sin 30^\circ = \frac{1}{2}$ $\frac{1}{2} = \frac{50\sqrt{3}}{AC} \rightarrow AC = 100\sqrt{3}$ $(100\sqrt{3})^2 - (50\sqrt{3})^2$

$= 30000 - 7500 = 22500 \rightarrow \sqrt{22500} = 150 = BC$ $BC = BD + DC$

$150 = 50 + x \rightarrow x = 100$

ب) $\cos 40^\circ = \frac{1}{2}$ $\frac{1}{2} = \frac{x}{AC} \rightarrow AC = x$ $x^2 - 2^2 = 14 - 4 = 12 \rightarrow \sqrt{12} = 2\sqrt{3} = BC$
 $DC = (2\sqrt{3})^2 + 1^2 = 12 + 1 = 13 \rightarrow \sqrt{13}$ $\sin \alpha = \frac{1}{\sqrt{13}} \times \frac{\sqrt{13}}{\sqrt{13}} = \frac{\sqrt{13}}{13}$



$110^\circ = 10^\circ + 45^\circ + \hat{B} \rightarrow \hat{B} = 35^\circ$

$\frac{\sqrt{2}}{2} = \frac{AH}{AC}$ $AH = \frac{\sqrt{2}AC}{2}$ $\frac{\sqrt{2}}{2} = \frac{CH}{AC}$ $CH = \frac{\sqrt{2}AC}{2}$

$\Rightarrow CH = AH$ $\frac{1}{2} = \frac{CH}{CB}$ $CB = 2CH$ $CB = 2AH$ $\frac{\sqrt{2}}{2} = \frac{BH}{CB}$ $BH = \frac{\sqrt{2}CB}{2}$

$BH = \sqrt{2}AH$ $AC = \sqrt{2}AH$ $AB = AH + BH$ $AB = AH + \sqrt{2}AH$

$\frac{AB}{AC} = \frac{(1+\sqrt{2})AH}{\sqrt{2}AH} = \frac{\sqrt{2} + \sqrt{4}}{2}$

$\hat{B}_1 = \hat{B}_2$ $\frac{AB}{BC} = \frac{x}{4} = \frac{EB}{BD} = \frac{1}{4} \rightarrow \triangle ABE \sim \triangle CBD$ $S_{\Delta} = \frac{1}{2} ab \sin \alpha$

$\frac{ABE}{BCD} = \frac{\frac{1}{2} \times 4 \times 4 \times \sin 45^\circ}{\frac{1}{2} \times 4 \times 4 \times \sin 45^\circ} = \frac{4}{4}$

نام خانوادگی: آلاء شاه پوری

پاسخ نامه نشریه کالیفرنیا شماره: ۲۰

کلاس: دهم دفتر C

الف) $S_{\square} = ab \sin \alpha$

$$S_{\square} = 3 \times 4 \times \sin 120^\circ = 12 \times \frac{\sqrt{3}}{2} = 6\sqrt{3}$$

ب) $S_{\square} = \frac{1}{2} ab \sin \alpha \rightarrow$ در اینجا a و b قطر هستند $S_{\square} = \frac{1}{2} \times 3 \times 4 \times \frac{\sqrt{3}}{2} = 3\sqrt{3}$

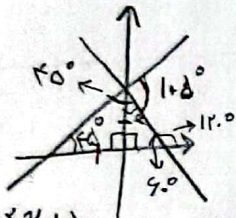
شیب $\tan \theta = \frac{y_B - y_A}{x_B - x_A}$

$$\tan \theta = \frac{4-2}{3-(-1)} = \frac{2}{4} = \frac{1}{2}$$

$$\tan^2 \theta + 1 = \frac{1}{\cos^2 \theta}$$

$$\left(\frac{1}{2}\right)^2 + 1 = \frac{1}{\cos^2 \theta} \rightarrow \frac{5}{4} = \frac{1}{\cos^2 \theta}$$

$$\cos \theta = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$$



$$110 = 10\alpha + 4\beta + 2\gamma \rightarrow \alpha = 30^\circ$$

$$2y = 2x + d$$

$$y = x + \frac{d}{2}$$

$$\text{شیب} = \tan = 1 \rightarrow \tan 45^\circ = 1$$

$$y = mx + b \rightarrow b_1 = b_2 \Rightarrow b_2 = \frac{d}{2}$$

عرض از مبدا

$$\tan 135^\circ = -\sqrt{3} \Rightarrow m = -\sqrt{3}$$

$$y = -\sqrt{3}x + \frac{d}{2} \quad mb = \frac{-d\sqrt{3}}{2}$$

$$f\left(\frac{5\pi}{9}\right) = \cos\left(\pi + \frac{5\pi}{9}\right) + \sin\left(\frac{\pi}{3} - \frac{5\pi}{9}\right) - \tan\left(\frac{4\pi}{3} + \frac{5\pi}{9}\right) =$$

$$\cos\left(\frac{14\pi}{9}\right) + \sin\left(\frac{-2\pi}{3}\right) - \tan\left(\frac{17\pi}{9}\right) = \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} - \sqrt{3} = -\sqrt{3}$$

$$\sin\left(\frac{17\pi}{9} + \pi\right) + \cos\left(\frac{15\pi}{9} - \pi\right)$$

$$\sin\left(\pi + \frac{17\pi}{9} + \pi\right) + \cos\left(\pi + \frac{17\pi}{9} - \pi\right)$$

$$\cos(3\pi + \pi) - \sin(4\pi - \pi)$$

$$\cos(3\pi + \pi) - \sin(4\pi - \pi)$$

$$\frac{\cancel{\cos} \pi - \cancel{\sin} \pi}{-\cancel{\cos} \pi + \cancel{\sin} \pi} = -1$$