عادله سعادت نیا

الف $(\sin 120^\circ + \sin 300^\circ)(\cos 210^\circ - \cos 180^\circ) =$ (1)

$$\left(\frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2}\right) = \frac{3}{4} - \frac{3}{4} = -\frac{1}{4}$$

ب) $$\frac{1 + 3\left(\frac{\sqrt{3}}{3}\right)^2}{4\left(\frac{\sqrt{3}}{2}\right)^2 + 2\left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1 + 3\left(\frac{1}{3}\right)}{4\left(\frac{3}{4}\right) + 2\left(\frac{1}{2}\right)} = \frac{1+1}{3+1} =$$

$$\frac{2}{4} = \frac{1}{2}$$

(2)

الف $$HA = \frac{\sqrt{2}}{2} \times \sqrt{6} = \frac{\sqrt{3}}{2} = \sqrt{4}$$

$$\overline{HC}^2 = (2\sqrt{3})^2 - (\sqrt{3})^2 = 12 - 3 = 9 \rightarrow HC = \sqrt{9} = 3$$

ب) $\frac{\sqrt{3}}{2} = \frac{9}{x} = \sqrt{3}x = 18 \rightarrow x = \frac{18}{\sqrt{3}} = \frac{18\sqrt{3}}{3} = 6\sqrt{3}$

$$\frac{1}{2}(9\sqrt{3}) = 3\sqrt{3} = AH$$

$$\frac{3\sqrt{3}}{3\sqrt{6}} = \frac{\sqrt{18}}{6} = \frac{3\sqrt{2}}{6} = \frac{\sqrt{2}}{2} \rightarrow B = 45^\circ$$

(3)

الف) $$AD = \frac{\sqrt{3}}{2}x = 50\sqrt{3} \rightarrow x = \frac{50\sqrt{3}}{\frac{\sqrt{3}}{2}} = \frac{100\sqrt{3}}{3} = 100$$

$$AC = \frac{1}{2}x = 50\sqrt{3} \rightarrow x = 100\sqrt{3}$$

$$BD = \frac{1}{2} \times 100 = 50 \quad | \quad BC = \frac{\sqrt{3}}{2} \times 100\sqrt{3} = 150$$

$$x = \overline{BC} - \overline{BD} = 150 - 50 = 100$$

ب) $C = 30^\circ \rightarrow \frac{1}{2}x = 2 \rightarrow x = 4 = \overline{AC}$

$\overline{BC} = \frac{\sqrt{3}}{2} \times 4 = 2\sqrt{3}$ | $\overline{DC}^2 = 1 + (2\sqrt{3})^2 = 13 \rightarrow$

$\overline{DC} = \sqrt{13}$ $\quad \sin\alpha = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$

(۴)

$HC = \frac{x}{2} = \frac{\sqrt{2}}{2}a \rightarrow a = \frac{\frac{x}{2}}{\frac{\sqrt{2}}{2}} = \frac{2x}{2\sqrt{2}} = \frac{\sqrt{2}}{2}x$

$AH = \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}x = \frac{2}{4}x \rightarrow AB = \frac{2}{4}x + 2\frac{\sqrt{3}}{4}x =$

$\frac{2+2\sqrt{3}}{4}x$.

$\frac{AB}{AC} = \frac{\frac{2+2\sqrt{3}}{4}x}{\frac{\sqrt{2}}{2}x} = \frac{2(2+2\sqrt{3})}{4\sqrt{2}} =$

$\frac{2+2\sqrt{3}}{2\sqrt{2}} = \frac{2(1+\sqrt{3})}{2\sqrt{2}} = \frac{1+\sqrt{3}}{\sqrt{2}} \rightarrow \frac{AB}{AC} = \frac{(1+\sqrt{3})\sqrt{2}}{2}$

(۵)

$S_{ABE} = \frac{1}{2} \times 2 \times 4 \times \sin B_1 = 4\sin B_1$

$S_{BCD} = \frac{1}{2} \times 6 \times 3 \times \sin B_2 = 9\sin B_2$

متقابل به رأس $\rightarrow B_1 = B_2 \rightarrow \sin B_1 = \sin B_2 \rightarrow \frac{S(ABE)}{S(BCD)} =$

$\frac{4\sin B_1}{9\sin B_2} = \frac{4}{9}$

الف) $S_{①} = \frac{1}{2} \times 4 \times 3 \times \sin 120 = \frac{6\sqrt{3}}{2} = 3\sqrt{3}$ (۶)

$2 \times 3\sqrt{2} = 6\sqrt{3}$

ب) $S = \frac{1}{2} \times 3 \times 4 \times \sin 120 = 3\sqrt{3}$

(۷) $m = \frac{4-2}{3-(-1)} = \frac{2}{4} = \frac{1}{2} \rightarrow m = \tan\alpha = \frac{1}{2}$

$1 + \tan^2 a = \frac{1}{\cos^2 a} \rightarrow \cos^2\alpha = \frac{1}{1+\tan^2\alpha} = \frac{1}{1+\frac{1}{4}} =$

$\frac{1}{\frac{5}{4}} = \frac{4}{5}$ $\quad \cos\alpha = \pm\sqrt{\frac{4}{5}} = \frac{2}{\sqrt{5}} = \pm\frac{2\sqrt{5}}{5}$

(۸) $b = \frac{a}{2} \rightarrow y = mx + \frac{a}{2}$

$2y = 2x + 5$ $\quad y = \frac{mx}{2} + b$ | زاویه با $\tan 120^\circ$ $m = -\sqrt{3}$

عرض از مبدا b

$mb = -\frac{5\sqrt{3}}{2}$

$\hookrightarrow y = x + \frac{5}{2} \rightarrow m = 1 \rightarrow \tan\alpha = 1 \rightarrow \alpha(ab) = 45^\circ$

(۹) $f(x) = \cos(\pi + x) + \sin\left(\frac{\pi}{2} - x\right) - \tan\left(\frac{3\pi}{2} + x\right)$

$\hookrightarrow -\cos x + \cos x + \cot x = \cot x$ $\quad f\left(\frac{5\pi}{4}\right)$

$\frac{5\pi}{4} = 135^\circ \rightarrow f\left(\frac{5\pi}{4}\right) =$ $\cot 135^\circ = -\frac{\sqrt{3}}{3}$

موضوع:

تاریخ:

(10)

$$\frac{\sin\left(\frac{10\pi}{2}+x\right)+\cos\left(\frac{10\pi}{2}-x\right)}{\cos(2\pi+x)-\sin(4\pi-x)} = \frac{\cos x+\sin x}{-\cos x-(-\sin x)} =$$

$$\frac{\cos x+\sin x}{\sin x-\cos x}$$