سنیا فاضلی

Date: Sub:

۱- الف)

$$\tan\frac{8\pi+3\pi}{4} + \sin\frac{12\pi+3\pi}{4} \times \cos\frac{12\pi+\pi}{4} =$$

$$\tan 225^\circ + \sin 315^\circ \times \cos 225^\circ = (-1) + \left(-\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2}\right) = -\frac{1}{2}$$

ب) $$\tan\frac{12\pi+5\pi}{6} \times \sin\frac{6\pi+4\pi}{3} + \cos\frac{6\pi+6\pi}{3} =$$

$$\tan 150^\circ \times \sin 300^\circ + \cos 240^\circ = -\frac{1}{\sqrt{3}} \times \left(-\frac{\sqrt{3}}{2}\right) + \left(-\frac{1}{2}\right) = 0$$

۲-

$$\cot x = 4 \longrightarrow \frac{\cos x}{\sin x} = 4 \rightarrow \cos x = 4\sin x$$

$$\frac{3(4\sin x) - \sin x}{4\sin x + \sin x} = \frac{11\sin x}{5\sin x} = \frac{11}{5}$$

۳-

$$\sin\alpha = 2\cos\alpha \rightarrow \sqrt{1-\cos^2\alpha} = 2\cos\alpha$$

$$1-\cos^2\alpha = 4\cos^2\alpha$$

$$1 = 5\cos^2\alpha \rightarrow \cos^2\alpha = \frac{1}{5} \rightarrow \cos\alpha = \pm\frac{\sqrt{5}}{5}$$

ربع سوم

$$-\frac{\sqrt{5}}{5}$$

۴- الف)

$$\cos\left(\frac{11\pi}{4} + \alpha\right) \rightarrow \cos\frac{11\pi}{4}\cos\alpha - \sin\frac{11\pi}{4}\sin\alpha =$$

$$\sin\alpha = \frac{\sqrt{2}}{10} \rightarrow \sqrt{1-\cos^2\alpha} = \frac{\sqrt{2}}{10} \rightarrow 1-\cos^2\alpha = \frac{1}{50}$$

$$\cos^2\alpha = \frac{49}{50} \rightarrow \cos\alpha = \pm\frac{7}{\sqrt{50}}$$

ربع دوم

$$\cos\alpha = -\frac{7}{\sqrt{50}}$$

$$-\frac{\sqrt{2}}{2} \times \left(-\frac{7}{\sqrt{50}}\right) + \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{10} = \frac{8}{10} = \frac{4}{5}$$

$\frac{7}{10}$ $\frac{1}{10}$

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۶- $\sin\left(\frac{13\pi}{6}+a\right) = \sin\frac{13\pi}{6}\cos a + \cos\frac{13\pi}{6}\sin a$

$\frac{1}{\cos^2 a} = 1 + \frac{1}{49} \rightarrow \frac{1}{\cos^2 a} = \frac{50}{49} \rightarrow \cos^2 a = \frac{49}{50} \rightarrow \cos a = \pm\frac{7}{\sqrt{50}}$

$\cos a = \frac{7}{\sqrt{50}}$ (زاویه اول)

$\sin a = \frac{1}{\sqrt{50}}$

$\left(-\frac{\sqrt{3}}{2}\times\frac{7}{\sqrt{50}}\right)+\left(\frac{-\sqrt{3}}{2}\times\frac{1}{\sqrt{50}}\right) = -\frac{8}{10} = -\frac{4}{5}$

$-\frac{7}{10}$ $\quad -\frac{1}{10}$

۵-

$2\sin^2\alpha + (1-\sin^2\alpha) = \frac{3}{4}$

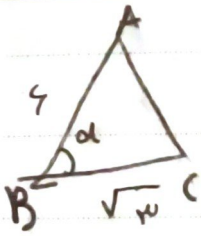
$2\sin^2\alpha + 1 - \sin^2\alpha = \frac{3}{4}$

$\sin^2\alpha = \frac{1}{4}$

$\cos^2\alpha = 1-\sin^2\alpha \rightarrow \cos^2\alpha = \frac{3}{4}$

$\tan^2\alpha = \frac{\sin^2\alpha}{\cos^2\alpha} = \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{3}$

۶-



$\frac{1}{2}\times 6\times\sqrt{3}\times\sin\alpha = 4.5$

$\sqrt{3}\times\sin\alpha = 1.5$

$\sin\alpha = \frac{1.5\times\sqrt{3}}{\sqrt{3}\times\sqrt{3}} = \frac{1.5\sqrt{3}}{3} = \frac{1}{2}\times\sqrt{3} = \frac{\sqrt{3}}{2}$

$\alpha = 60^\circ$ یا 120°

$\frac{120}{60} = 2$

۷-

$a\times b\times\sin 150^\circ = 54$

$ab\times\frac{1}{2} = 54 \rightarrow ab = 108 \rightarrow a\times\frac{3a}{2} = 108 \rightarrow \frac{3a^2}{2} = 108$

$\frac{a}{b} = \frac{2}{3} \rightarrow b = \frac{3a}{2}$

$3a^2 = 216$

$a^2 = 72$

$a = \sqrt{72} \rightarrow 6\sqrt{2}$

$\sqrt{36\times 2}$

محیط $= 2(6\sqrt{2}+9\sqrt{2}) = 30\sqrt{2}$

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۸-

$S_{ABC} - S_{ADE} = 1,75$

$\frac{1}{2} \times 5 \times 7 \times \sin \hat{A} - \frac{1}{2} \times 7 \times 4 \times \sin \hat{A} = 1,75$

$\frac{35}{4} \sin A - 14 \sin \hat{A} = 1,75$

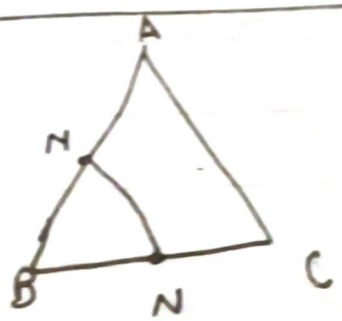
$3,5 \sin A = 1,75$

$2 \sin A = 1 \rightarrow \sin \hat{A} = \frac{1}{2}$

$\cos \hat{A} = \sqrt{1 - \sin^2 \hat{A}} = \sqrt{1 - \frac{1}{4}} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$

$\tan \hat{A} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

۹-



$3\overline{BN} = 2NC \rightarrow NC = \frac{3}{2} BN$

$\frac{1}{2} \times AB \times BC \times \sin B = 3 \times \frac{1}{2} \times BM \times BN \times \sin B$

$(BM + AM) \times (BN + NC) = 3 BM \times BN$

$(BM + AM) \times (\frac{5}{2} BN) = 3 \times BM \times BN$

$\frac{5}{2} (BM + AM) = 3 BM$

$\frac{5}{2} BM + \frac{5}{2} AM = 3 BM$

$\frac{5}{2} AM = \frac{1}{2} BM \rightarrow 5 AM = 1 BM$

$\frac{BM}{AM} = \frac{5}{1}$

۱۰- ناحیه سوم