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طیبا توکلیان

۱- الف) $\tan\left(\frac{۳\pi}{۴}\right) + \sin\left(\frac{۷\pi}{۴}\right) \times \cos\left(\frac{۵\pi}{۴}\right)$

$۰۱ + \frac{-\sqrt{۲}}{۲} \times \frac{-\sqrt{۲}}{۲} = -۱ + \frac{۱}{۲} = \frac{-۱}{۲}$

ب) $\tan\left(\frac{۵\pi}{۶}\right) \times \sin\left(\frac{۵\pi}{۳}\right) + \cos\left(-\frac{۴\pi}{۳}\right)$

$\frac{-\sqrt{۳}}{۳} \times \frac{-\sqrt{۳}}{۲} + \left(-\frac{۱}{۲}\right) = \frac{۳}{۶} - \frac{۱}{۲} = ۰$

۲- $\frac{\frac{۳\cos\alpha}{\sin\alpha} - \frac{\sin\alpha}{\sin\alpha}}{\frac{\cos\alpha}{\sin\alpha} + \frac{\sin\alpha}{\sin\alpha}} = \frac{۳\cot - ۱}{\cot + ۱} = \frac{۱۲-۱}{۴+۱} = \frac{۱۱}{۵}$

۳- $(۲\cos\alpha)^۲ + \cos^۲ = ۱$

$۴\cos^۲ + \cos^۲ = ۱$

$۵\cos^۲ = ۱$

$\cos^۲ = \frac{۱}{۵}$

$\cos = \pm\frac{۱}{\sqrt{۵}}$

Arman

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الف)

$$\cos\left(\frac{11\pi}{6}+\alpha\right)$$

$$\frac{11\pi}{6} = 2\pi + \frac{3\pi}{6}$$

$$\cos\left(\frac{11\pi}{6}+\alpha\right) = \cos\left(\frac{3\pi}{6}+\alpha\right)$$

$$\sin\alpha = \frac{\sqrt{7}}{10} \Rightarrow \sin^2\alpha = \frac{7}{100} \qquad \cos^2\alpha = 1 - \frac{7}{100}$$

$$\cos\alpha = -\sqrt{\frac{93}{100}} = \frac{-\sqrt{93}}{10} \Leftarrow = \frac{93}{100}$$

$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

$$\beta = \frac{3\pi}{6} \qquad \cos\frac{3\pi}{6} = -\frac{\sqrt{3}}{2} \qquad \sin\frac{3\pi}{6} = \frac{1}{2}$$

$$\frac{-\sqrt{3}}{2}\left(\frac{-\sqrt{93}}{10} + \frac{\sqrt{7}}{10}\right) = \boxed{\frac{3}{5}}$$

ب) $\sin = \frac{1}{\sqrt{50}} = \frac{1}{5\sqrt{2}}$

$\cos = \frac{7}{5\sqrt{2}} = \frac{7\sqrt{2}}{10}$

$\frac{13\pi}{4} = 3\pi + \frac{\pi}{4}$

$\sin\left(\frac{13\pi}{4} + x\right) = -\sin\left(x + \frac{\pi}{4}\right)$

$\sin\left(\alpha + \frac{\pi}{4}\right) = \sin\alpha\frac{\sqrt{2}}{2} + \cos\alpha\frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2}(\sin\alpha + \cos\alpha)$

$= \frac{\sqrt{2}}{10} + \frac{7\sqrt{2}}{10}$

$\frac{4\sqrt{2}}{5}$

$\sin\left(\alpha + \frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}\frac{4\sqrt{2}}{5} = \frac{2}{2} \times \frac{4}{5} = \frac{4}{5}$ 1a

$= \boxed{\frac{4}{5}}$

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$2\sin^2 x + \cos^2 x = \frac{4}{3}$ -5

$\cos^2 = 1 - \sin^2 x$

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

$\sin^2 = \frac{1}{3}$, $\cos^2 = \frac{2}{3}$ $\tan^2 = \frac{\sin^2 x}{\cos^2}$

$\frac{\frac{1}{3}}{\frac{2}{3}} = \boxed{\frac{1}{2}}$

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۶- $S_{\triangle} = \frac{1}{2} ab \sin C \rightarrow \frac{1}{2} \times \sqrt{3} \times 4 \times \sin\alpha = 4\sqrt{3}$

$\sin\alpha = \frac{\sqrt{3}}{2} \rightarrow \alpha = \frac{\pi}{3} \quad \alpha = \frac{2\pi}{3}$

$\frac{\frac{2\pi}{3}}{\frac{\pi}{3}} = \boxed{2}$

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$a = ۲k \qquad b = ۳k$

$S = a \cdot b \cdot \sin\theta = ۵۶ \qquad \theta = ۱۵۰^\circ$

$\sin ۱۵۰^\circ = \frac{۱}{۲}$

$ab \times \frac{۱}{۲} = ۵۶ \Rightarrow \boxed{ab = ۱۰۸}$

$۲k \times ۳k = ۶k^۲ = ۱۰۸ \Rightarrow k^۲ = ۱۸$

$k = ۳\sqrt{۲} \qquad a = ۶\sqrt{۲} \qquad b = ۹\sqrt{۲}$

$۲(a+b) = ۲(۶\sqrt{۲} + ۹\sqrt{۲}) = ۳۰\sqrt{۲}$

$۱۵\sqrt{۲}$

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$S_{ABC} = x \times AB \times AC$

$S_{ADE} = x \times AD \times AE$

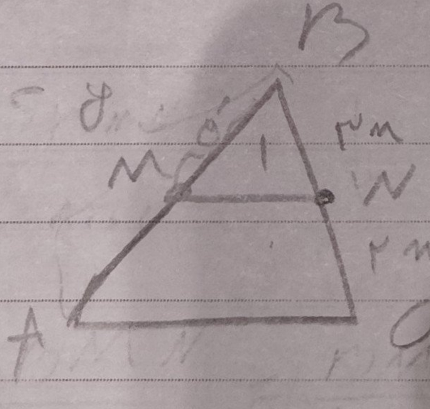
$S_{ABC} - S_{ADE} = x(AB \times AC - AD \times AE)$

$AB \times AC - AD \times AE = ۳۵ - ۲۸ = ۷$

$۷x = ۱/۷۵$ $x = \frac{۱}{۴} \to \frac{۱}{۲}\sin A$

$\boxed{\tan = \frac{۱}{\sqrt{۳}}} \Leftarrow \sin A = \frac{۱}{۲}$

-۹



$۵x \times y = ۳x \times y \times ۳$

$۵x \times y = ۹xy$

$\frac{y}{y} = \frac{۹}{۵}$ $\frac{BA}{BM}$

$\frac{BM}{AM} = \boxed{\frac{۵}{۴}}$

$$\frac{1}{\sqrt{\cos^2}} \cdot \tan\alpha \rightarrow \frac{1}{|\cos|} \cdot \frac{\sin}{\cos}$$

$$\frac{|\sin\alpha|}{\cos} = \frac{1}{\frac{\cos\alpha}{\sin\alpha}} \rightarrow \frac{|\sin\alpha|}{\cos\alpha} = \frac{\sin\alpha}{\cos\alpha}$$

در ربع سوم