نام و نام خانوادگی ......پریان عظیمی........ پاسخنامه تشریحی تکلیف شماره ..۱۸.. کلاس ..دهم پنج.. ۱۴۰۲/۸ ۶:۲۰

۱

الف) $\tan\frac{11\pi}{4} = \tan(2\pi + \frac{3\pi}{4}) = \tan\frac{3\pi}{4} \to -1$ | $\cos\frac{13\pi}{4} = \cos(3\pi + \frac{\pi}{4}) = -\cos\frac{\pi}{4} = -\frac{\sqrt{2}}{2}$

$\sin\frac{15\pi}{4} = \sin(4\pi - \frac{\pi}{4}) = -\sin\frac{\pi}{4} = -\frac{\sqrt{2}}{2} \longrightarrow -1 + (-\frac{\sqrt{2}}{2})(-\frac{\sqrt{2}}{2}) = -1 + \frac{1}{2}$ $-\frac{1}{2}$

ب) $\tan\frac{17\pi}{6} = \tan(3\pi - \frac{\pi}{6}) = \tan\frac{\pi}{6} = \frac{1}{\sqrt{3}}$ | $\cos\frac{10\pi}{3} = \cos(3\pi + \frac{\pi}{3}) = -\cos\frac{\pi}{3} = -\frac{1}{2}$

$\sin\frac{11\pi}{3} = \sin(4\pi - \frac{\pi}{3}) = -\sin\frac{\pi}{3} = -\frac{\sqrt{3}}{2} \longrightarrow \frac{1}{\sqrt{3}} \times (-\frac{\sqrt{3}}{2}) + (-\frac{1}{2}) = -\frac{1}{2} + \frac{1}{2} = 0$

۲

$\frac{\cos\alpha}{\sin\alpha} = 4$

$\frac{3\cos\alpha - \sin\alpha}{\cos\alpha + \sin\alpha} = \frac{3\cot\alpha - 1}{\cot\alpha + 1} = \frac{3(4) - 1}{4+1} = \frac{11}{5}$

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در ربع سوم $\Rightarrow \cos\alpha = -\frac{\sqrt{5}}{5}$

$\sin\alpha = 2\cos\alpha$

$\to \sin^2\alpha + \cos^2\alpha = 1$

جایگذاری $\sin\alpha = 2\cos\alpha \to (2\cos\alpha)^2 + \cos^2\alpha = 1 \to 4\cos^2\alpha + \cos^2\alpha = 1 \to 5\cos^2\alpha = 1$

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

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

۴

الف) $\sin^2\alpha + \cos^2\alpha = 1$

$\frac{2}{100} + \cos^2\alpha = 1$

$\cos^2\alpha = \frac{98}{100} \to \pm$

ربع دوم $\to \cos\alpha = -\frac{7\sqrt{2}}{10}$

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

$\frac{11\pi}{4} = 2\pi + \frac{3\pi}{4}$ | $\cos\frac{11\pi}{4} = \cos\frac{3\pi}{4} = -\frac{\sqrt{2}}{2}$

$\sin\frac{11\pi}{4} = \sin\frac{3\pi}{4} = \frac{\sqrt{2}}{2}$

$(-\frac{\sqrt{2}}{2})(-\frac{7\sqrt{2}}{10}) - (\frac{\sqrt{2}}{2})(\frac{\sqrt{2}}{10})$

$\frac{14}{20} - \frac{2}{20} = \frac{12}{20} = \frac{3}{5}$

۵

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

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

$2 - \cos^2\alpha = \frac{4}{3} \to -\cos^2\alpha = \frac{4}{3} - 2 \to -\cos^2\alpha = \frac{4-6}{3}$

$\to -\cos^2\alpha = -\frac{2}{3} \to \cos^2\alpha = \frac{2}{3}$ | $\sin^2\alpha = 1 - \cos^2\alpha \to$

$\to \sin^2\alpha = 1 - \frac{2}{3} \to \sin^2 = \frac{1}{3} \Rightarrow \tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{\frac{1}{3}}{\frac{2}{3}} = \boxed{\frac{1}{2}}$

$\frac{\sin\alpha}{\cos\alpha} = \frac{1}{7}$

$\sin\alpha = \frac{1}{7}\cos\alpha$

$\sin^2\alpha + \cos^2\alpha = 1$

$(\frac{1}{7}\cos\alpha)^2 + \cos^2\alpha = 1$

$\frac{1}{49}\cos^2\alpha + \cos^2\alpha = 1$

$\cos^2\alpha(\frac{1}{49} + 1) = 1 \to \cos^2\alpha = \frac{49}{50}$

ربع اول $\cos\alpha = \frac{7}{\sqrt{50}} = \frac{7}{5\sqrt{2}} = \frac{7\sqrt{2}}{10}$

ادامه سوال

$\sin\alpha = \frac{1}{7} \cdot \frac{7\sqrt{2}}{10} = \frac{\sqrt{2}}{10}$

$\sin(\frac{13\pi}{4} + \alpha) = \sin(\frac{13\pi}{4})\cos\alpha + \cos(\frac{13\pi}{4})\sin\alpha$

$\frac{13\pi}{4} = 3\pi + \frac{\pi}{4} \to \sin\frac{13\pi}{4} = \sin(3\pi + \frac{\pi}{4}) = -\sin\frac{\pi}{4} = -\frac{\sqrt{2}}{2}$

$(-\frac{\sqrt{2}}{2})(\frac{7\sqrt{2}}{10}) + (-\frac{\sqrt{2}}{2})(\frac{\sqrt{2}}{10})$

$= -\frac{7\times2}{20} - \frac{2}{20} \to -\frac{14}{20} - \frac{2}{20} = -\frac{16}{20} = -\frac{4}{5}$

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۶

$S_{\text{مثلث}} = \frac{1}{2} ab \sin\alpha \rightarrow \frac{1}{2} \times \sqrt{3} \times 6 \times \sin\alpha = \frac{9}{2}$

$\rightarrow 3\sqrt{3} \sin\alpha = \frac{9}{2}$

$\rightarrow \sin\alpha = \frac{9}{2\times 3\sqrt{3}}$

$\rightarrow \sin\alpha = \frac{9\sqrt{3}}{2\times 9\sqrt{3}} \rightarrow$ تبدیل $\frac{3\sqrt{3}}{6} = \frac{\sqrt{3}}{2}$

با توجه به اینکه ۲ زاویه داریم $\begin{cases} 60 \\ 120 \end{cases}$

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

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$S = ab \sin\alpha \rightarrow 54 = 3x \times 4x \times \sin 150 \rightarrow 54 = 3x \times 4x \times \frac{1}{2} \rightarrow 54 = 6x^2$

$x^2 = \frac{54}{3} \rightarrow x^2 = 18 \rightarrow x = \sqrt{18} \rightarrow x = 3\sqrt{2}$

اضلاع: $a = 2\times 3\sqrt{2} = 6\sqrt{2}$

$b = 3\times 3\sqrt{2} = 9\sqrt{2}$

محیط $= 2(\underbrace{9\sqrt{2}+6\sqrt{2}}^{15\sqrt{2}}) = 30\sqrt{2}$

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$S_{A\hat{B}C} = \frac{1}{2} \times 5 \times 7 \times \sin A \rightarrow 17/5 \sin A$

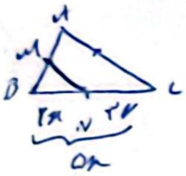
$S_{ADE} = \frac{1}{2} \times 4 \times 7 \times \sin A = 14 \sin A$

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

$\sin A = \frac{1}{2} \rightarrow A = 30^\circ \rightarrow \cos\alpha = \frac{\sqrt{3}}{2} \rightarrow \tan\alpha = \frac{\sqrt{3}}{3}$

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

۹



$\frac{S_{A\hat{B}C}}{S_{B\hat{M}N}} = 3 \Rightarrow \frac{\frac{1}{2} AB \cdot BC \times \sin B}{\frac{1}{2} BM \cdot BN \times \sin B} = \frac{AB \times BC}{BM \times NB} = 3$

$\frac{AB \times 5x}{BM \times 2x} = \frac{5AB}{2BM} = 3$

$5AB = 6BM$

$BM = \frac{5}{6} AB$

$AB - BM = AM$

$AB - \frac{5}{6}AB = AM \rightarrow AM = \frac{1}{6} AB$

$\frac{BM}{AM} = \frac{\frac{5}{6}AB}{\frac{1}{6}AB} = 5$

۱۰

$\tan\alpha = \frac{1}{|\cos\alpha|} - \frac{1+\sin\alpha}{|\cos\alpha|} = \frac{1-(1+\sin\alpha)}{|\cos\alpha|} \rightarrow \frac{\sin\alpha}{\cos\alpha} = \frac{-\sin\alpha}{|\cos\alpha|} \rightarrow \sin\alpha \cdot |\cos\alpha| = -\sin\alpha \cos\alpha$

$|\cos\alpha| = -\cos\alpha$

$\cos\alpha < 0$

↓

ربع دوم و سوم

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha}$

$|\sin\alpha| = -\sin\alpha$

$\sin\alpha < 0$

↓

ربع سوم و چهارم

ربع سوم = ربع دوم و سوم ∩ ربع سوم و چهارم