نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

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$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} = \frac{\cos\alpha}{|\sin\alpha|}$ $\quad \frac{1}{\sqrt{\cos^2\alpha}} - \frac{1}{\cot\alpha} = \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} = \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha}$

$= \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha = |\cos\alpha| \rightarrow \cos\alpha > 0$ ناحیه‌ی اول یا چهارم

$\cot\alpha = \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow |\sin\alpha| = \sin\alpha \Rightarrow \sin\alpha > 0$ ناحیه‌ی اول یا دوم

$\Rightarrow$ ناحیه‌ی اول ← جواب

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$-\frac{\pi}{12} < u < \frac{3\pi}{12} \Rightarrow -\frac{2\pi}{12} < 2u < \frac{10\pi}{12} \Rightarrow -\frac{\pi}{6} < 2u < \frac{3\pi}{6}$

$-\frac{1}{2} < \sin 2\alpha \leq 1 \Rightarrow -\frac{1}{2} < \frac{m-1}{4} \leq 1 \Rightarrow -2 < m-1 \leq 4 \Rightarrow -1 < m \leq 5$ ← جواب

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$\tan u + \cot u = -2 \Rightarrow \frac{1}{\sin u \cos u} = -2 \Rightarrow \sin u \cos u = -\frac{1}{2}$

$\frac{3\pi}{4} < u < 2\pi \Rightarrow \frac{3\pi}{4} < u < \pi$

$\frac{1}{\sin^3 u + \cos^3 u} = \frac{1}{(\sin u + \cos u)(\sin^2 u + \cos^2 u - \sin u \cos u)} = \frac{1}{\frac{\sqrt{3}}{2} \times \frac{3}{2}} = \frac{1}{\frac{3\sqrt{3}}{4}} = \frac{4}{3\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{9}$ ← جواب

$(\sin u + \cos u)^2 = \sin^2 u + \cos^2 u + 2\sin u \cos u \Rightarrow \sin u + \cos u = \pm\frac{1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$ ← ناحیه‌ی چهارم

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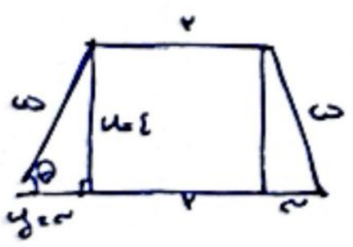

$S = \frac{1}{2}(2+8) \times 7 = 35$ ← جواب

$\cos\theta = \frac{4}{5} = 0.8 \Rightarrow y = 3u = 6$

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$10^\circ = \alpha$

$280^\circ = 270^\circ + 10^\circ$

$-140^\circ = -180^\circ + 10^\circ$

$690^\circ = 720^\circ + 10^\circ$

$-360^\circ = 270^\circ - 10^\circ$

$\tan\left(\frac{3\pi}{2}+\alpha\right)\tan(-\pi+\alpha) - \sin(4\pi+\alpha)\cos\left(\frac{3\pi}{2}-\alpha\right)$

$= \underbrace{(-\cot\alpha)(\tan\alpha)}_{-1} - \underbrace{(\sin\alpha)(-\sin\alpha)}_{-\sin^2\alpha} = -1 - (-\sin^2\alpha) = -1 + \sin^2\alpha = -\cos^2\alpha$

$K = -1$ ← جواب

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$\alpha = 240^\circ$

$\sqrt{2}\cos(210^\circ)\sin(240^\circ) - \sqrt{2}\sin(150^\circ)\cos(150^\circ) = -\frac{\pi}{2}\sin(\frac{3\pi}{2} - \alpha) - \cos(\pi - \alpha) =$

$\cos(210^\circ) = -\frac{\sqrt{3}}{2}$, $\sin(240^\circ) = -\frac{\sqrt{3}}{2}$, $\sin(150^\circ) = \frac{\sqrt{2}}{2}$, $\cos(150^\circ) = -1$

$-\frac{\pi}{2}(-\cos\alpha) + \cos\alpha = \frac{\pi}{2}\cos\alpha + \cos\alpha = \frac{\pi+2}{2}\cos\alpha \Rightarrow$ مدهم $\frac{\pi+2}{2}$ کے جواب

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$\cos\frac{\pi}{12} = \cos(15^\circ) = \cos(45^\circ)\cos(30^\circ) + \sin(45^\circ)\sin(30^\circ) = \frac{\sqrt{2}}{2}\times\frac{\sqrt{3}}{2} + \frac{1}{2}\times\frac{\sqrt{2}}{2} = \frac{\sqrt{6}+\sqrt{2}}{4} = \sqrt{\frac{2+\sqrt{3}}{4}}$

$f(\frac{\pi}{24}) = 14\cos^2(\frac{\pi}{24})\cos^2(\frac{4\pi}{24})\cos^2(\frac{12\pi}{24})\cos^2(\frac{24\pi}{24}) = 14\cos^2(\frac{\pi}{12})\cos^2(\frac{\pi}{6})\cos^2(\frac{\pi}{2})\cos^2(\frac{\pi}{24})$

$\cos^2(\frac{\pi}{24}) = \frac{1}{2}$, $\cos^2(\frac{\pi}{2}) = 0$, $\cos^2(\frac{\pi}{6}) = \frac{3}{4}$, $\cos^2(\frac{\pi}{12}) = \frac{2+\sqrt{3}}{4}$

$14(\frac{2+\sqrt{3}}{4})\times\frac{3}{4}\times\frac{1}{2}\times\frac{1}{2} = \frac{3}{32}\times\frac{7+4\sqrt{3}}{2} = \frac{21+12\sqrt{3}}{64}$ کے جواب

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$1-\sin\alpha = 4+4\sin\alpha \Rightarrow 3\sin\alpha = -3 \Rightarrow \sin\theta = -\frac{3}{5}$

$\cos\theta = -\frac{4}{5}$

$\tan\frac{\alpha}{2} = \frac{\sin\theta}{1+\cos\theta} = \frac{-\frac{3}{5}}{\frac{1}{5}} = -3$ ← (ب) جواب

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$\frac{1-\cos\theta}{\sin\theta} + \frac{\sin\theta}{1+\cos\theta} = \tan\frac{\theta}{2}$ جوابی $\Rightarrow \frac{\sin\theta}{1-\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = \cot\frac{\theta}{2} + \cot\frac{\theta}{2} = 2\cot\frac{\theta}{2} = k\cot\frac{\theta}{2} \Rightarrow k = 2$ کے جواب

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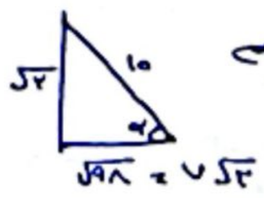

نسبتیں $\Rightarrow \cos\theta = \frac{-7\sqrt{2}}{10}$

$\cos(\frac{11\pi}{4} + \alpha) = \cos\frac{11\pi}{4}\cos\alpha - \sin\frac{11\pi}{4}\sin\alpha = -\frac{\sqrt{2}}{2}\times\frac{-7\sqrt{2}}{10} = \frac{\sqrt{2}}{2}\times\frac{7\sqrt{2}}{10}$

$\cos(2\pi + \frac{3\pi}{4}) = -\frac{\sqrt{2}}{2}$

$= \frac{7}{10} - \frac{1}{10} = 0.6$ کے جواب