

نام و نام خانوادگی آریه بیله بیلیس پاسخنامه تشریحی تکلیف شماره ۱/۱... کلاس ۱۰.....

(الف) $\tan \frac{3\pi}{4} + \sin \frac{3\pi}{4} \cos \frac{\pi}{4}$

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

(ب) $\tan \frac{5\pi}{4} \sin \frac{3\pi}{4} + \cos \frac{\pi}{4}$

$$-\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} + \frac{1}{2} = -\frac{2}{4} + \frac{1}{2} = -\frac{1}{2} + \frac{1}{2} = \boxed{0}$$

$$\frac{3 \cos x - \sin x}{\cos x + \sin x} = \frac{3 \cos x - \sin x}{\sin x} \cdot \frac{\cos x + \sin x}{\cos x + \sin x} = \frac{3 \cos x - 1}{\frac{\cos x}{\sin x} + 1} = \frac{3 \cot x - 1}{\cot x + 1} = \frac{3 \times 1 - 1}{1 + 1} = \frac{2}{2} = 1$$

$$\sin^2 \alpha + \cos^2 \alpha = 1 \xrightarrow{\sin \alpha = \frac{1}{2} \cos \alpha} 5 \cos^2 \alpha + \cos^2 \alpha = 1 \Rightarrow 6 \cos^2 \alpha = 1 \Rightarrow \cos^2 \alpha = \frac{1}{6}$$

با توجه به اینکه α در ربع دوم است
کسیژن منفی $\cos \alpha = -\frac{1}{\sqrt{6}} = -\frac{\sqrt{6}}{6}$

(الف) $\cos \alpha = -\sqrt{1 - \sin^2 \alpha} = -\sqrt{1 - \frac{4}{100}} = -\sqrt{\frac{96}{100}} = -\frac{\sqrt{24}}{5}$

$$\cos\left(\frac{11\pi}{6} + \alpha\right) = \cos\left(\frac{3\pi}{2} + \alpha\right) = \cos \frac{3\pi}{2} \cos \alpha - \sin \frac{3\pi}{2} \sin \alpha$$

$$\cos \frac{3\pi}{2} = -\frac{\sqrt{2}}{2}, \sin \frac{3\pi}{2} = \frac{\sqrt{2}}{2}$$

$$\cos\left(\frac{3\pi}{2} + \alpha\right) = \left(-\frac{\sqrt{2}}{2}\right)\left(-\frac{\sqrt{24}}{5}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{5}\right) = \frac{2}{5}$$

(ب) $\sin\left(\frac{13\pi}{6} + \alpha\right) = \sin\left(2\pi + \frac{\pi}{6} + \alpha\right)$

$$= \sin\left(\pi + \frac{\pi}{6} + \alpha\right) = -\sin\left(\frac{\pi}{6} + \alpha\right)$$

$$\sin\left(\frac{\pi}{6} + \alpha\right) = \frac{\sqrt{2}}{2} (\sin \alpha + \cos \alpha)$$

$$\sin \alpha = \frac{1}{4\sqrt{2}}, \cos \alpha = \frac{\sqrt{2}}{4\sqrt{2}}$$

$$\sin\left(\frac{\pi}{6} + \alpha\right) = \frac{\sqrt{2}}{2} \times \frac{1}{4\sqrt{2}} = \frac{1}{4} \rightarrow -\frac{1}{4}$$

$$2 \sin^2 x + \cos^2 x = \frac{5}{6} \Rightarrow 2 + \tan^2 x + 1 = \frac{5}{6} \left(\frac{1}{\cos^2 x} \right)$$

$$2 + \tan^2 x + 1 = \frac{5}{6} (1 + \tan^2 x) \Rightarrow 2 + \tan^2 x + 1 = \frac{5}{6} + \frac{5}{6} \tan^2 x \Rightarrow \left(2 - \frac{5}{6}\right) \tan^2 x = \frac{5}{6} - 1$$

$$\Rightarrow \frac{7}{6} \tan^2 x = \frac{1}{6} \Rightarrow \tan^2 x = \frac{1}{7}$$

$$S_{\triangle ABC} = \frac{1}{2} AB \cdot AC \cdot \sin \alpha = \frac{1}{2} (\sqrt{r})(4)(\sin \alpha) = 2\sqrt{r} \sin \alpha$$

$$2\sqrt{r} \sin \alpha = \frac{9}{r} \Rightarrow \sin \alpha = \frac{9}{r \times 2\sqrt{r}} \times \frac{\sqrt{r}}{\sqrt{r}} = \frac{\sqrt{r}}{r}$$

$$\sin \alpha = \frac{\sqrt{r}}{r} \xrightarrow{0 < \alpha < 180^\circ} \begin{cases} \alpha_1 = 30^\circ \\ \alpha_2 = 150^\circ \end{cases} \Rightarrow \frac{\alpha_2}{\alpha_1} = 1$$

$$a = 2K \quad b = 3K$$

$$(2K)(3K) \sin 120^\circ = \Delta$$

$$4K^2 \times \frac{1}{2} = \Delta$$

$$2K^2 = \Delta \rightarrow K^2 = \frac{\Delta}{2}$$

$$K = \sqrt{\frac{\Delta}{2}}$$

$$\text{مجموع} = (4\sqrt{r} + 4\sqrt{r}) \div 2 = 4\sqrt{r}$$

$$S_{\triangle ABC} - S_{\triangle ADE} = 1/VA$$

$$\frac{1}{2} \times 6 \times V \times \sin A - \frac{1}{2} \times 4 \times V \times \sin A = 1 + 0/VA \rightarrow \left(\frac{6}{2} - \frac{4}{2}\right) \sin A = 1 + \frac{0}{V}$$

$$\Rightarrow \frac{V}{2} \sin A = \frac{V}{2} \Rightarrow \sin A = \frac{1}{2} \Rightarrow A = 30^\circ$$

$$\tan A = \tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\frac{BMN}{ABC} = \frac{BM}{AB} \times \frac{BN}{BC}$$

$$ABC = 3 \quad BMN = 1$$

$$AM = AB - BM = AB - \frac{4}{9} AB = \frac{5}{9} AB$$

$$\frac{1}{3} = \frac{BM}{AB} \times \frac{4}{9}$$

$$\frac{BM}{AB} = \frac{1}{3} \times \frac{9}{4} = \frac{3}{4}$$

$$BM = \frac{3}{4} AB$$

$$\frac{BM}{AM} = \frac{\frac{4}{9} AB}{\frac{5}{9} AB} = \boxed{\frac{4}{5}}$$

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

$$\Rightarrow \frac{-\sin \alpha}{|\cos \alpha|} = \frac{\sin \alpha}{\cos \alpha} \Rightarrow \frac{-1}{|\cos \alpha|} = \frac{1}{\cos \alpha} \Rightarrow |\cos \alpha| = -\cos \alpha \Rightarrow \cos \alpha < 0$$

$$\frac{|\sin \alpha|}{\cos \alpha} = \frac{-1}{\cos \alpha} \Rightarrow \frac{|\sin \alpha|}{\cos \alpha} = \frac{-1}{\cos \alpha} \Rightarrow \frac{|\sin \alpha|}{\cos \alpha} = \frac{-\sin \alpha}{\cos \alpha} \Rightarrow |\sin \alpha| = -\sin \alpha$$

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المثلث قائم الزاوية $\sin \alpha < 0$

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