نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۷ کلاس یازدهم B .....

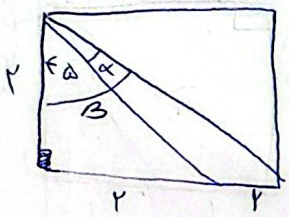
(۲۰)

۱

$$S = \frac{1}{2} \times 4 \times \sqrt{2} \times \sin\alpha = 6 \Rightarrow \sin\alpha = \frac{9}{4\sqrt{3}} = \frac{\sqrt{3}}{2}$$

$$\sin\alpha = \frac{\sqrt{3}}{2} \begin{cases} \alpha = \frac{\pi}{3} \\ \alpha = \frac{2\pi}{3} \end{cases} \longrightarrow \frac{a_{max}}{a_{min}} = \frac{\frac{2\pi}{3}}{\frac{\pi}{3}} = 2$$

۲

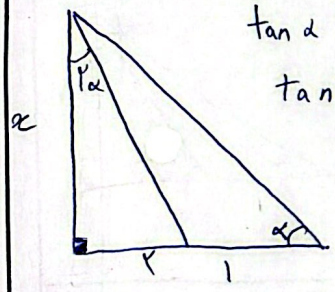


$$\tan\alpha = \tan(\beta - 45) = \frac{\tan\beta - \tan 45}{1 + \tan\beta \tan 45} = \frac{2-1}{1+2} = \frac{1}{3}$$

$$\alpha + 45 = \beta \rightarrow \alpha = \beta - 45 \qquad \tan\beta = \frac{6}{3} = 2$$

$$\cot\alpha = 3$$

۳



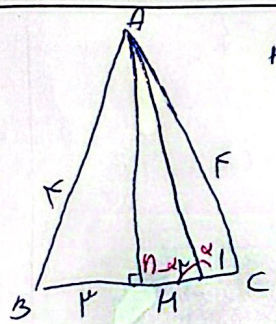
$$\tan\alpha = \frac{x}{3}$$

$$\tan 2\alpha = \frac{2}{x} \rightarrow \tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \rightarrow \frac{2}{x} = \frac{2\left(\frac{x}{3}\right)}{1-\frac{x^2}{9}}$$

$$\frac{x^2}{3} = 1 - \frac{x^2}{9} \rightarrow x^2 = \frac{9}{4} \rightarrow x = \frac{3}{2}$$

$$\cot\alpha = \frac{3}{\frac{3}{2}} = 2$$

۴



$$AB^2 = AH^2 + BH^2 \rightarrow 16 = AH^2 + 9 \rightarrow AH^2 = 7 \rightarrow AH = \sqrt{7}$$

$$\tan(180-\alpha) = \frac{\sqrt{7}}{2} \rightarrow -\tan\alpha = \frac{\sqrt{7}}{2} \rightarrow \tan\alpha = -\frac{\sqrt{7}}{2}$$

۵

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

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

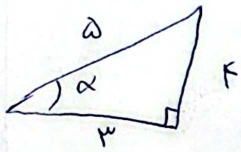
$$\frac{\sin^4\alpha+4(1-\sin^2\alpha)}{1+1-\sin^2\alpha}-\frac{\cos^4\alpha+4(1-\cos^2\alpha)}{1+1-\cos^2\alpha}=\frac{\sin^4\alpha-4\sin^2\alpha+4}{2-\sin^2\alpha}$$ ۶

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

$$-\sin^2\alpha+2+\cos^2\alpha-1=\cos^2\alpha-\sin^2\alpha=\cos2\alpha$$

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

$$=(\cos\alpha)(-\sin\alpha)+\cot\alpha=(-\frac{3}{5}\times\frac{4}{5})+\frac{3}{4}=\frac{-48+75}{100}=\frac{27}{100}=0/27$$ ۷



$$x=\frac{\pi}{12}\to 3\cos4x+\sqrt{2}(\sin x-\cos x)=3\cos\frac{\pi}{3}+\sqrt{2}(\sqrt{2}\sin(\underbrace{\frac{\pi}{12}-\frac{\pi}{4}}_{-\frac{1}{2}}))$$

$$=\frac{3}{2}+\sqrt{2}\times\frac{-\sqrt{2}}{2}=\frac{3}{2}-1=\frac{1}{2}$$ ۸

$$\tan2\alpha=\frac{2\tan\alpha}{1-\tan^2\alpha}\qquad \tan\alpha=\frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}}=\frac{\frac{2}{4}}{1-\frac{1}{16}}=\frac{8}{15}$$

$$1+\tan^2\alpha=\frac{1}{\cos^2\alpha}\to1+\frac{64}{225}=\frac{1}{\cos^2\alpha}\to\cos^2\alpha=\frac{225}{289}\to\cos\alpha=\frac{15}{17}$$ ۹

$$\to\sin\alpha=\sqrt{1-\frac{225}{289}}=\frac{8}{17}\qquad\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha}=\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}}=\frac{-16}{105}$$

$$2\sin\alpha-2\sin\alpha\cos\alpha<0\to2\sin\alpha\underbrace{(1-\cos\alpha)}_{+}<0\to\sin\alpha<0$$

$$\frac{\cot\alpha}{\sin\alpha}>0\to\frac{\cos\alpha}{\underbrace{\sin^2\alpha}_{+}}>0\to\cos\alpha>0$$ ۱۰

ناحیه چهارم