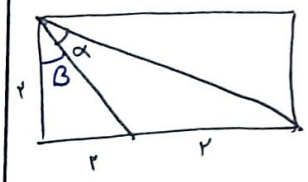
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۷ کلاس یازدهم A .....

۱ (۲)

$S = \frac{1}{2} ab \sin\alpha \longrightarrow 4,5 = 4\alpha\sqrt{2}\alpha\frac{1}{2}\alpha\sin\alpha \longrightarrow \sin\alpha = \frac{\sqrt{2}}{2}$

$\alpha < 180^\circ \longrightarrow \alpha = 45^\circ \text{ یا } 135^\circ \longrightarrow \frac{\max\alpha}{\min\alpha} = \frac{135^\circ}{45^\circ} = 3$ ✓

۲ (۲)



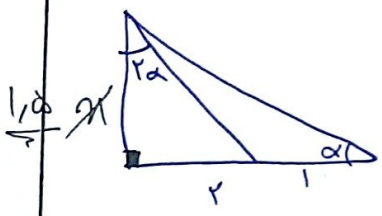
$\cot\alpha = ?$

$\tan(\alpha+\beta) = \frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta} \longrightarrow \tan(\alpha+\beta) = \frac{4}{2} = 2$

$\tan(\beta) = \frac{2}{2} = 1$

$\longrightarrow 2 = \frac{\tan\alpha+1}{1-\tan\alpha} \longrightarrow \tan\alpha = \frac{1}{3} \longrightarrow \cot\alpha = 3$ ✓

۳ (۲)

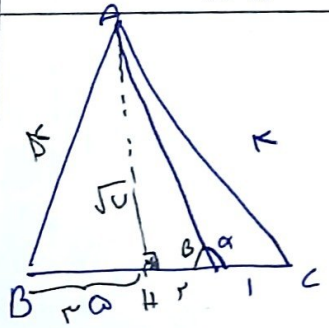


$\tan 2\alpha = \frac{2}{x} \qquad \tan\alpha = \frac{x}{3}$

$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \Rightarrow \frac{2}{x} = \frac{2\frac{x}{3}}{1-\frac{x^2}{9}} \Rightarrow \frac{2}{x} = \frac{\frac{2x}{3}}{\frac{9-x^2}{9}}$

$\longrightarrow \frac{2}{x} = \frac{6x}{9-x^2} \Rightarrow 6x^2 = 18 - 2x^2 \longrightarrow 8x^2 = 18 \longrightarrow x^2 = 2.25 \longrightarrow x = 1.5 \longrightarrow \cot\alpha = \frac{2}{1.5} = 2$ ✓

۴ (۲)



$\alpha+\beta = \pi \longrightarrow \tan\alpha = -\tan\beta$

$AH^2 + 2^2 = 4^2 \longrightarrow AH = \sqrt{5}$

$\longrightarrow \tan\beta = \frac{\sqrt{5}}{2} \longrightarrow \tan\alpha = -\frac{\sqrt{5}}{2}$ ✓

۵ (۲)

$2\sin^2 m + \cos^2 m = \frac{4}{3} \longrightarrow \sin^2 m + 1 = \frac{4}{3} \longrightarrow \sin^2 m = \frac{1}{3} \longrightarrow \cos^2 m = \frac{2}{3}$

$\tan^2 m = \frac{\sin^2 m}{\cos^2 m} = \frac{1/3}{2/3} = \frac{1}{2}$ ✓

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

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

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

$\rightarrow \frac{\sin^4-\cos^4\alpha+4\cos^2\alpha-4\sin^2\alpha+\sin^4\alpha-\cos^4\alpha}{2+\sin^2\cos^2}$, $\frac{4\cos^2-4\sin^2+\sin^4-\cos^4}{2+\sin^2\cos^2}$

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

(2) ۶

$\tan\alpha = \frac{4}{3} \rightsquigarrow \sin\alpha = \frac{4}{5}$, $\cos\alpha = \frac{3}{5}$, $\cot\alpha = \frac{3}{4}$

$\sin\left(\frac{9\pi}{2}+\alpha\right)\cos\left(\frac{7\pi}{2}-\alpha\right)-\tan(\alpha-2\pi)$

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

$\cos\alpha(-\sin\alpha)+\cot\alpha \rightarrow -\sin\alpha\cos\alpha+\cot\alpha \rightarrow \frac{4}{5}\times\frac{3}{5}+\frac{3}{4}$

$\rightarrow -\frac{12}{25}+\frac{3}{4} \rightarrow \frac{-48+75}{100} = \frac{27}{100}$ ✓

(2) ۷

$\sin m \pm \cos m = \sqrt{2}\sin\left(m \pm \frac{\pi}{4}\right) \rightarrow \sqrt{2}\sin m - \sqrt{2}\cos m = \sqrt{2}\left(\sqrt{2}\sin\left(m-\frac{\pi}{4}\right)\right)$

$\rightarrow \sqrt{2}\sin m - \sqrt{2}\cos m = 2\sin\left(\frac{\pi}{12}-\frac{\pi}{4}\right) = -2\sin(30^\circ) = -2\left(\frac{1}{2}\right) = -1$

$2\cos 4m = 2\cos 4\left(\frac{\pi}{12}\right)$, $2\cos\frac{\pi}{3} = 2\cos 60^\circ = 2\left(+\frac{1}{2}\right) = +2$

$\rightarrow 2\cos 4m + \sqrt{2}\sin m - \sqrt{2}\cos m = +\frac{2}{2} - 1 = +1$ ✓

(2) ۸

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

$= \frac{\frac{1}{3}}{\frac{8}{9}} = \frac{3}{8} = \tan\alpha \rightarrow \sin\alpha = \frac{3}{17}$, $\cos\alpha = \frac{15}{17}$

$\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha} = \frac{\frac{3}{15}-\frac{3}{17}}{\frac{3}{15}-\frac{15}{17}}$ $\frac{17\times3-15\times3}{15\times17} = \frac{14}{15\times17}$, $\frac{-2}{-17} = \frac{14}{15\times17}$, $-\frac{14}{15\times17}$ ✓

(2) ۹

$2\sin\alpha < \sin 2\alpha \rightarrow 2\sin\alpha < 2\sin\alpha\cos\alpha$ $\xrightarrow{\sin\alpha>0}$ $1 < \cos\alpha$

$\xrightarrow{\sin\alpha<0}$ $\cos\alpha < 1$ $\rightarrow$ $\sin\alpha < 0$

$\cot\alpha < \frac{\cos\alpha}{\sin\alpha} \rightarrow \frac{\frac{\cos\alpha}{\sin\alpha}}{1} < \frac{1}{\cos\alpha} \rightarrow \cos\alpha < \cos\alpha$

$\sin\alpha \rightarrow \ominus$ $\cos\alpha \rightarrow \oplus$ $\rightarrow$ ✓ ق ی

(2) ۱۰