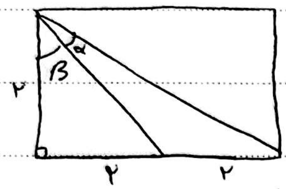
* تکلیف شماره ۲۷     * یازدهم دفتر B

Date: / /   Sat Sun Man Tue Thu Wed Fri   Subject: * حسنا موسوی

① $S = \frac{1}{2} \times 6 \times \sqrt{3} \times \sin a = 4.5 \rightarrow \sin\alpha = \frac{4.5}{3\sqrt{3}} = \frac{\sqrt{3}}{2} \rightarrow a = 60°$ یا $120°$

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

②

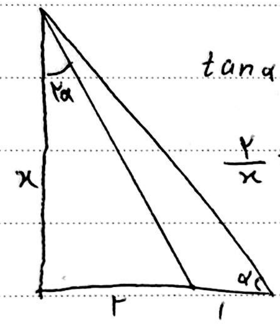



$\tan\beta = 1 \qquad \tan(\alpha+\beta) = 2$

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

$\rightarrow \boxed{\cot\alpha = \frac{1}{1/3} = 3}$

③

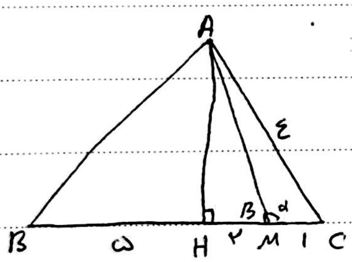



$\tan\alpha = \frac{x}{3} \qquad \tan 2\alpha = \frac{2}{x} \rightarrow \tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \rightarrow \frac{2}{x} = \frac{\frac{2x}{3}}{1-\frac{x^2}{9}} \rightarrow$

$\frac{2}{x} = \frac{6x}{9-x^2} \rightarrow 6x^2 = 18 - 2x^2 \rightarrow 18 = 8x^2 \rightarrow x^2 = 9/4 \rightarrow x = \pm 3/2 \rightarrow x = 3/2$

$\tan\alpha = \frac{x}{3} = \frac{3/2}{3/1} = 1/2 \rightarrow \boxed{\cot\alpha = \frac{1}{1/2} = 2}$

④




$HC = 6/2 = 3 \rightarrow HM = 2 \rightarrow AH = \sqrt{16-9} = \sqrt{7}$

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

$-\tan\beta$

⑤ $\sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_{1} = 4/3 \rightarrow \sin^2 x = 1/3 \Rightarrow \cos^2 x = 2/3 \rightarrow \tan^2 x = \frac{1/3}{2/3} = \boxed{\frac{1}{2}}$

⑥ $\frac{\sin^4\alpha + 4(1-\sin^2\alpha)}{1+\cos^2\alpha} - \frac{\cos^4\alpha + 4(1-\cos^2\alpha)}{1+\sin^2\alpha} \Rightarrow \frac{(\sin^2\alpha - 2)^2}{1+\cos^2\alpha} - \frac{(\cos^2\alpha-2)^2}{1+\sin^2\alpha}$

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

⑦

$\sin(9\pi/2 + a) \rightarrow \cos\alpha$

$\cos(\frac{7\pi}{2} - \alpha) \rightarrow -\sin\alpha$

$-\tan(\alpha - 5\pi/2) = \tan(3\pi/2 - \alpha) = \cot\alpha$

$\tan\alpha = 4/3 \rightarrow \sin = -4/5, \cos = -3/5$

$\Rightarrow \cos\alpha(-\sin\alpha) + \cot\alpha \rightarrow (-3/5)(4/5) + 3/4 =$

$-12/25 + 3/4 = \frac{-48+75}{100} = \frac{27}{100} = 0.27$

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$$3\cos 4x + 2\left(\frac{\sqrt{2}}{2}\sin x - \frac{\sqrt{2}}{2}\cos x\right) = 3\cos 4x + 2\sin\left(x - \frac{\pi}{4}\right)$$ (۸)

$$\Rightarrow 3\cos\frac{\pi}{3} + 2\sin\left(-\frac{\pi}{6}\right) = 3\left(\frac{1}{2}\right) - 2\left(\frac{1}{2}\right) = \boxed{\frac{1}{2}}$$

$$\tan\alpha = \frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}} = \frac{\frac{1}{2}}{1-\frac{1}{16}} = \frac{8}{15} \quad , \quad \sin\alpha = \frac{2\tan\frac{\alpha}{2}}{1+\tan^2\frac{\alpha}{2}} = \frac{\frac{1}{2}}{1+\frac{1}{16}} = \frac{8}{17} \rightarrow \cos\alpha = \frac{15}{17}$$ (۹)

$$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \frac{\frac{136-120}{255}}{\frac{-7}{17}} = \frac{16\times 17}{-7\times 255} = -\frac{16}{105}$$

$$2\sin\alpha < 2\sin\alpha\cos\alpha \longrightarrow \sin\alpha - \sin\alpha\cos\alpha < 0 \rightarrow \sin\overbrace{(1-\cos\alpha)}^{+} < 0$$ (۱۰)

$$\Rightarrow \sin\alpha < 0 \quad , \quad \frac{\cot\alpha}{\sin\alpha} > 0 \xrightarrow{\sin\alpha < 0} \cot\alpha < 0$$

$$\begin{cases} \cot < 0 \\ \sin < 0 \end{cases} \longrightarrow \cos\alpha > 0 \longrightarrow \begin{cases} \cos\alpha > 0 \\ \sin\alpha < 0 \end{cases}$$ ربع چهارم