Subject:
Date

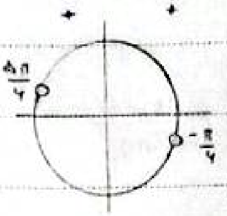
لیلا الیکی — کلاس ... شماره ۲۸

(۱
$$\frac{1}{\sqrt{\cos^2\alpha}} - \frac{1}{\cot\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{\sin\alpha}{\cos\alpha} = \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \underset{+}{\cos\alpha} = \underset{+}{|\cos\alpha|} \quad (1)$$

$$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} \Rightarrow \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \Longrightarrow \underset{+}{\sin\alpha} = \underset{+}{|\sin\alpha|} \quad (2)$$

$\overset{(1),(2)}{\Rightarrow}$ $\cos\alpha, \sin\alpha$ مثبت $\Rightarrow$ ناحیه اول مثلثاتی

(۲
$$-\frac{\pi}{12} < x < \frac{5\pi}{12} \Rightarrow -\frac{\pi}{6} < 2x < \frac{5\pi}{6}$$



$$\Rightarrow -\frac{1}{2} < \sin 2x \leq 1$$

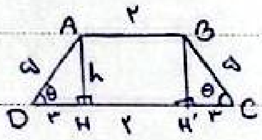
$$\sin 2x = \frac{m-1}{4} \Rightarrow -\frac{1}{2} < \frac{m-1}{4} \leq 1 \Rightarrow -1 < m \leq 5$$

(۳
$$\tan x + \cot x = \frac{2}{\sin 2x} = -3 \Rightarrow \sin 2x = -\frac{2}{3} \rightsquigarrow \sin 2x = 2\sin x\cos x = -\frac{2}{3} \to \sin x\cos x = -\frac{1}{3}$$

$$3\pi < 4x < 4\pi \Rightarrow \frac{3\pi}{4} < x < \pi \qquad \sin x + \cos x = \sqrt{\sin^2 x + \cos^2 x + 2\sin x\cos x} = \sqrt{1-\frac{2}{3}} = \sqrt{\frac{1}{3}}$$

$$\frac{1}{\sin^3 x + \cos^3 x} = \frac{1}{(\sin x + \cos x)(\sin^2 x + \cos^2 x - \sin x\cos x)} = \frac{1}{(\sqrt{\frac{1}{3}})(1+\frac{1}{3})} = \frac{3\sqrt{3}}{4}$$

(۴



$$\cos\theta = \frac{DH}{AD} = \frac{CH'}{BC} = \frac{6}{10} \Rightarrow DH = CH' = 3$$

$$AB = HH' = 2$$

$$\sin\theta = \sqrt{1-0.36} = 0.8 = \frac{h}{5} \Rightarrow h = 4$$

$$S = \frac{1}{2} \times 4 \times (2+8) = 20$$

(۵
$$\tan(285°)\tan(-165°) - \sin(1095°)\cos 255° = \tan(\frac{3\pi}{2}+15)\tan(\pi+15) - \sin(6\pi+15)\cos(\frac{3\pi}{2}-15)$$

$$\Rightarrow -\cot 15\tan 15 - \sin 15(\sin 15) = \sin^2 15 - 1 = -\cos^2 15 = k\cos^2 15 \Rightarrow k = -1$$

(۶
$$\sqrt{3}\cos 210°\sin 243 - \sqrt{2}\sin 135\cos 153 = \sqrt{3} \times -\frac{\sqrt{3}}{2}\sin(\frac{3\pi}{2}-27) - \sqrt{2} \times \frac{\sqrt{2}}{2}\cos(\pi-27)$$

$$= +\frac{3}{2}\cos 27 + \cos 27 = \frac{5}{2}\cos 27 \Rightarrow$$ $\frac{5}{2}$ برابر

(۷
$$P(\frac{\pi}{24}) = 16\cos^2(\frac{\pi}{12})\cos^2(\frac{\pi}{6})\cos^2(\frac{\pi}{3})\cos^2(\frac{2\pi}{3}) \xrightarrow{\times\frac{\sin^2(\frac{\pi}{12})}{\sin^2(\frac{\pi}{12})}} \frac{16 \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}\sin^2\frac{4\pi}{3}}{\sin^2(\frac{\pi}{12})}$$

$$= \frac{\sin^2(4\frac{\pi}{3})}{\frac{1-\cos\frac{\pi}{6}}{2}} = \frac{2(-\frac{\sqrt{3}}{2})^2}{1-\cos\frac{\pi}{6}} = \frac{\frac{3}{2}}{1-\frac{\sqrt{3}}{2}} = \frac{3}{2-\sqrt{3}} = 6-3\sqrt{3}$$

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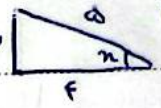
$\frac{1-\sin x}{1+\sin x} = 4 \Rightarrow 1-\sin x = 4+4\sin x \Rightarrow \sin x = \frac{-3}{5}$

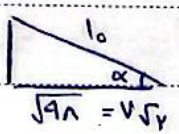


نصیری $\Rightarrow \cos = -\frac{4}{5}$ (۸

$\tan\frac{x}{2} = \frac{\sin x}{1+\cos x} = \frac{-\frac{3}{5}}{1-\frac{4}{5}} = -3$

$\frac{1-\cos\theta}{\sin\theta} = \frac{\sin\theta}{1+\cos\theta} = \tan\frac{\theta}{2} \rightsquigarrow \frac{\sin\theta}{1-\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = \frac{1}{\tan\frac{\theta}{2}} + \frac{1}{\tan\frac{\theta}{2}} = 2\cot\frac{\theta}{2} \Rightarrow k = 2$ (۹

$\sin\alpha = \frac{\sqrt{2}}{10}$



نصیری $\Rightarrow \cos\alpha = -\frac{7\sqrt{2}}{10}$ (۱۰

$\cos\left(\frac{11\pi}{4}+\alpha\right) = \cos\left(\frac{3\pi}{4}+\alpha\right) = \cos\frac{3\pi}{4}\cos\alpha - \sin\frac{3\pi}{4}\sin\alpha = -\left(\frac{\sqrt{2}}{2}\times\frac{-7\sqrt{2}}{10}\right) - \left(\frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{10}\right) = 0.4$