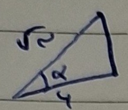
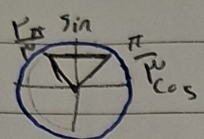
رشته تجربی یازدهم دفتر تکلیف ۲۷

①



$\frac{1}{\cancel{2}}\times\cancel{4}\times 3\sqrt{3}\times \sin\alpha = 4.5 = \frac{9}{2}$

$\sin\alpha = \frac{9}{2}\times\frac{1}{\cancel{3}\sqrt{3}} = \frac{\sqrt{3}}{2}$



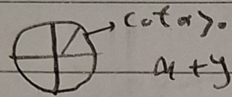
$\alpha = 60^\circ , 120^\circ \longrightarrow \frac{\frac{2\pi}{3}}{\frac{\pi}{3}} = 2$

$60^\circ \to \frac{\pi}{3}$ ، $120^\circ \to \frac{2\pi}{3}$

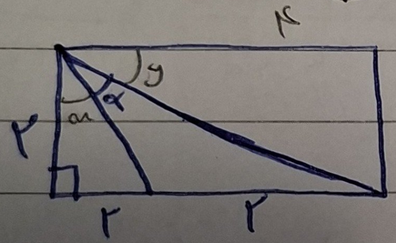
۲ برابر

②

$\cot\alpha = ?$



$x+y+\alpha = 90^\circ \longrightarrow \alpha = \frac{\pi}{2}-(x+y)$



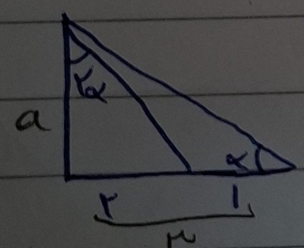
$\tan x = \frac{2}{2} = 1$ $\qquad \tan y = \frac{2}{4} = \frac{1}{2}$

$\cot\alpha = \cot\left(\frac{\pi}{2}-(x+y)\right) = \tan(x+y)$

$\tan(x+y) = \frac{\tan x+\tan y}{1-\tan x\tan y} = \frac{\frac{1}{2}+1}{1-(\frac{1}{2}\times 1)} = \frac{\frac{3}{2}}{\frac{1}{2}} = 3$

③

$\cot\alpha = ?$



$\underbrace{\tan(2\alpha)}_{\frac{2}{a}} = \frac{2\tan\alpha}{1-\tan^2\alpha}$

$\frac{\cancel{2}}{a} = \frac{\frac{\cancel{2}a}{3}}{1-\frac{a^2}{9}} = \frac{\frac{9-a^2}{9}}{}$ $\longrightarrow \frac{1}{a} = \frac{3a}{9-a^2}$

$3a^2 = 9-a^2$

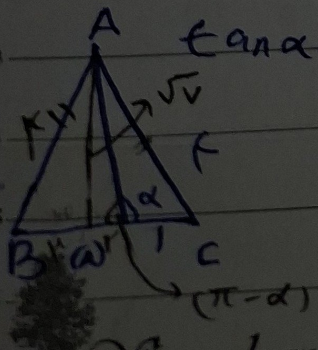
$4a^2 = 9 \longrightarrow a = +\frac{3}{2}$ ق ق

$\longrightarrow a = -\frac{3}{2}$ غ ق ق

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

④

در متساوی الساقین میانه‌ها ارتفاع است.



$\tan\alpha = ?$ $\quad AH^2 = 16-9 = 7$

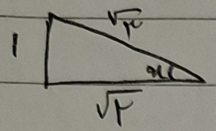
$AH^2 = (4)^2-(3)^2 \longrightarrow AH = \sqrt{7}$

حکم کلی برقرار

$\tan(\pi-\alpha) = \frac{\sqrt{7}}{2} \quad -\tan\alpha = \frac{\sqrt{7}}{2} \Rightarrow \tan\alpha = \boxed{\frac{-\sqrt{7}}{2}}$

$۲\sin^۲\alpha + \cos^۲\alpha = \frac{۴}{۳}$ $\tan^۲\alpha = ?$ $\sin^۲\alpha + \cos^۲\alpha = 1$ ۵

$\sin^۲\alpha + 1 = \frac{۴}{۳} \rightarrow \sin^۲\alpha = \frac{1}{۳} \rightarrow \sin\alpha = \frac{1}{\sqrt{۳}}$



$۳ - 1 = ۲$ $\tan^۲\alpha = \left(\frac{1}{\sqrt{۲}}\right)^۲ = \frac{1}{۲}$

۶

$\frac{\sin^۴\alpha + ۴\cos^۲\alpha}{1+\cos^۲\alpha} - \frac{\cos^۴\alpha + ۴\sin^۲\alpha}{1+\sin^۲\alpha}$

$\cos^۲\alpha \rightarrow 1-\sin^۲\alpha$ $\sin^۲\alpha \rightarrow 1-\cos^۲\alpha$

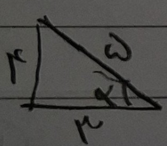
$\frac{\sin^۴\alpha + ۴ - ۴\sin^۲\alpha}{۲ - \sin^۲\alpha} = \frac{(۲-\sin^۲\alpha)^۲}{۲-\sin^۲\alpha}$ $\frac{\cos^۴\alpha + ۴ - ۴\cos^۲\alpha}{۲-\cos^۲\alpha} = \frac{(۲-\cos^۲\alpha)^۲}{۲-\cos^۲\alpha}$

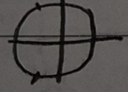
$(۲-\sin^۲\alpha) - (۲-\cos^۲\alpha) = \cos^۲\alpha - \sin^۲\alpha = \cos۲\alpha$

۷

$\tan\alpha = \frac{۴}{۳}$ ربع سوم $\sin\left(\frac{۹\pi}{۲}+\alpha\right)\cos\left(\frac{۷\pi}{۲}-\alpha\right) - \tan\left(\alpha - \frac{۳\pi}{۲}\right)$

$\frac{۴\pi}{۲}+\frac{\pi}{۲}$ $۲\pi + \frac{۳\pi}{۲}$ $+\tan\left(\frac{۳\pi}{۲}-\alpha\right)$





$(+\cos\alpha) \times (-\sin\alpha) + (\cot\alpha)$

$\left(\frac{-۳}{۵} \times \frac{+۴}{۵}\right) + \frac{۳}{۴} = ۰,۲۷$

$\frac{-۱۲}{۲۵} = \frac{-۴۸}{۱۰۰} + \frac{+۷۵}{۱۰۰}$

۸

$۳\cos۴\alpha + \sqrt{۲}\sin\alpha - \sqrt{۲}\cos\alpha$ $\alpha = \frac{\pi}{۱۲}$

$\sin\alpha - \cos\alpha = \sqrt{۲}\sin\left(\alpha - \frac{\pi}{۴}\right)$

$\sqrt{۲}(\sin\alpha - \cos\alpha) = ۲\sin\left(\frac{\pi}{۱۲} - \frac{\pi}{۴}\right)$ $-\frac{\pi}{۶}$ $= ۲ \times -\frac{1}{۲} = -1$ I

$۳\cos\left(۴ \times \frac{\pi}{۱۲}\right)$ $\frac{\pi}{۳}$ $= ۳ \times \frac{1}{۲} = \frac{۳}{۲}$ II   II − I $= \frac{۳}{۲} - 1 = \frac{1}{۲}$

SUBJECT:

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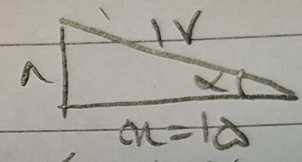
9

$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha}$ $\tan(\frac{\alpha}{۲}) = \frac{1}{۴}$

طبق فرمول $\sin\alpha = \frac{۲\tan(\frac{\alpha}{۲})}{1+\tan^۲(\frac{\alpha}{۲})} = \frac{\frac{1}{۲}}{\frac{۱۷}{۱۶}} = \frac{۸}{۱۷}$



$\cos\alpha = \frac{۱۵}{۱۷}$

$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{۸}{۱۵} - \frac{۸}{۱۷}}{\frac{۸}{۱۷} - \frac{۱۵}{۱۷}} = -\frac{۱۶}{۱۰۵}$ $\tan\alpha = \frac{۸}{۱۵}$

10

$۲\sin\alpha < \sin۲\alpha$ $\frac{\cot\alpha}{\sin\alpha} > 0$ انتهای کمان α در کدام ربع؟

$\cancel{۲}\sin\alpha < \cancel{۲}\sin\alpha\cos\alpha$ $\xrightarrow{\sin\alpha>0}$ $\cos\alpha > 1$ غ ق ق

$-1 \le \cos\alpha \le 1$: زیرا

$\xrightarrow{\sin\alpha<0}$ $\cos\alpha < 1$ ق ق ⇒ ناحیه چهارم

$\frac{\cot\alpha}{\sin\alpha} = \frac{\cos\alpha}{\sin^۲\alpha} > 0 \Rightarrow \cos\alpha > 0$