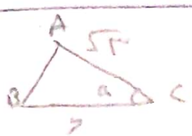
امیرمحمد فروجانی

یازدهم تجربی

تکلیف ۲۷

۱۸

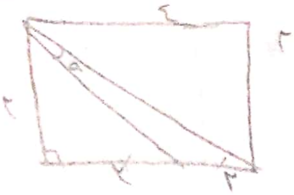


$S = \frac{1}{2} ab \sin a \to \frac{1}{2} \times \sqrt{2} \times \frac{3}{4} \sin a = ۴/۵$ $\to \sin a = \frac{\sqrt{2}}{2}$

$\frac{a_{max}}{a_{min}} = ?$ $\frac{12}{30} = (2)$ ✓

۲

cot a = ?



$\cot(a + \frac{\pi}{4}) = \frac{1 - \tan a}{1 + \tan a} = \frac{1}{2}$

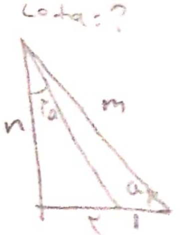
$\cot(\frac{\pi}{4} + a) = \frac{2}{4} = \frac{1}{2}$

$1 + \tan a = 2(1 - \tan a) \to 1 = 3\tan a \to \tan a = \frac{1}{3}$

$\cot a = 3$ ✓

۲

cot a = ?

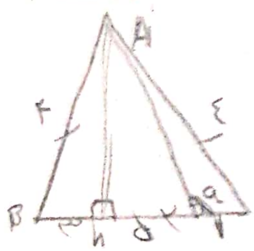


$\tan a = \frac{n}{3}$ $\tan 2a = \frac{2}{n}$ $\frac{2}{n} = \frac{2n}{3} \div 1 - (\frac{n^2}{9}) \to n = 1 \to \tan a = \frac{1}{3}$

$\cot a = 2$ ✓

۲

tan a = ?



$\tan a = \frac{-Ah}{3} \sqrt{7}$ $Ah^2 = 7 \to Ah = \sqrt{7}$

$-\frac{\sqrt{7}}{3}$ ✓

۲

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

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

$1 + \cot^2 x = \frac{1}{\sin^2 x} \to 1 + \cot^2 x = 3 \to \cot^2 x = 2 \to \cot x = \sqrt{2}$

$\tan^2 x = \frac{1}{2}$ ✓

۲

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

اتحاد $\to \frac{(2 - \sin^2 x)^2}{2 - \sin^2 x} - \frac{(2 - \cos^2 x)^2}{2 - \cos^2 x} \to 2 - \sin^2 x - 2 + \cos^2 x \to \cos^2 x - \sin^2 x \to \cos 2x$ ✓

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(۲)

$\tan a = \frac{۴}{۳}$ $\quad \sin(\frac{۹\pi}{۲} + a)\cos(\frac{۷\pi}{۲} - a) - \tan(a - \frac{۳\pi}{۲})$ $\quad \cos a = -\frac{۳}{۵}$, $\sin a = -\frac{۴}{۵}$, $\cot a = \frac{۳}{۴}$

$\cos a \times -\sin a - (-\cot a) \to -\sin a\cos a + \cot a$

$-(-\frac{۴}{۵} \times -\frac{۳}{۵}) + \frac{۳}{۴} \to -\frac{۱۲}{۲۵} + \frac{۳}{۴} \to \frac{-۴۸ + ۷۵}{۱۰۰} = \frac{۲۷}{۱۰۰}$

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(۲)

$۳\cos ۴x + \sqrt{۲}\sin x - \sqrt{۲}\cos x \quad x = \frac{\pi}{۱۲}$

جایگذاری

$۳\cos\frac{\pi}{۳} + \sqrt{۲}\sin\frac{\pi}{۱۲} - \sqrt{۲}\cos\frac{\pi}{۱۲} \to ۳\cos\frac{\pi}{۳} + \sqrt{۲}\sin(\frac{\pi}{۴} - \frac{\pi}{۶}) - \sqrt{۲}\cos(\frac{\pi}{۴} + \frac{\pi}{۶})$

$\frac{۱}{۲}$ $\quad \frac{\sqrt{۶} - \sqrt{۲}}{۴}$ $\quad \frac{\sqrt{۶} + \sqrt{۲}}{۴}$ $\quad \cos ۷۵° = \cos ۱۵°$

$\frac{۳}{۲} + \sqrt{۲}(\frac{\sqrt{۶} - \sqrt{۲}}{۴} - \frac{\sqrt{۶} + \sqrt{۲}}{۴}) \to \frac{۳}{۲} + \sqrt{۲}(-\frac{۲\sqrt{۲}}{۴}) \to \frac{۳}{۲} - ۱ \to \frac{۱}{۲}$

$\tan(\frac{a}{۲}) = \frac{۱}{۴}$ $\quad \frac{\tan a - \sin a}{\sin a - \cos a} = ?$

$۱ + \tan^۲ a = \frac{۱}{\cos^۲ a} \to \frac{۱۷}{۱۶} = \frac{۱}{\cos^۲ a} \to \cos a = \frac{۴}{\sqrt{۱۷}}$

$\frac{۱۶}{۱۷} + \sin^۲ a = ۱ \to \sin^۲ a = ۱ - \frac{۱۶}{۱۷} \to \sin a = \frac{۱}{\sqrt{۱۷}}$

$\frac{\sin a(۱ - \cos a)}{\cos a} \div \sin a - \cos a$ $\quad \frac{۱}{\sqrt{۱۷}} - \frac{۴}{\sqrt{۱۷}}$

$\frac{\sqrt{۱۷}}{۱۷} \div \frac{-۳}{\sqrt{۱۷}} \to \frac{\sqrt{۱۷}}{۱۷} \times -\frac{\sqrt{۱۷}}{۳} \to \frac{۱۷}{۵۱}$

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(۲)

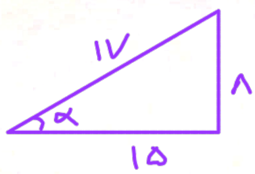
$۲\sin a < \sin ۲a$ $\quad \frac{\cot a}{\sin a} > ۰$ $\quad$ (۳)

$\frac{\cos x}{\sin x} \times \frac{۱}{\sin x} = \frac{\cos x}{\sin^۲ x} > ۰ \to \cos x > ۰ \to$ ۱ یا ۴

$۲\sin a < \sin ۲a \to \sin a(۱ - \cos a) > ۰ \to \sin a < ۰$

۶

$\tan \alpha = \frac{۲\tan\frac{\alpha}{۲}}{۱ - \tan^۲\frac{\alpha}{۲}} = \frac{۸}{۱۵}$



$\cos\alpha = \frac{۱۵}{۱۷}$

$\sin\alpha = \frac{۸}{۱۷}$

$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = -\frac{۱۴}{۱۰۵}$