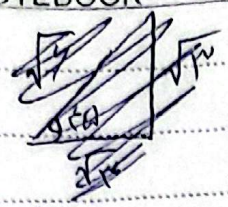
آزمون ارسالی — یازدهم ریاضی A — شماره ۲۷ — ۱۷, ۱۷۵

NOTEBOOK

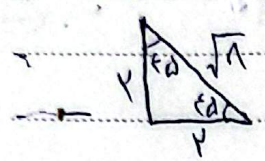


$\frac{\text{مساحت}}{\text{محیط}} = \frac{\text{ک}}{\text{ک}}$ ۱۷۵

$\alpha = 120°$ دقت!

مساحت مثلث $= \frac{1}{2} \times 4 \times \sqrt{3} \times \sin\alpha = \frac{9}{2} \rightarrow \sin\alpha = \frac{\sqrt{3}}{2}$ ، $\alpha = 60$ $\frac{120}{60}$ ۲

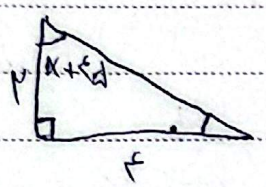
۲- ۵



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

$\tan\alpha + 1 = 2 - 2\tan\alpha$

$3\tan\alpha = 1 \rightarrow \tan\alpha = \frac{1}{3} \rightarrow \cot\alpha = 3$



$\tan(\alpha + \frac{\pi}{4}) = +\cot$ ۳

۳- ۲

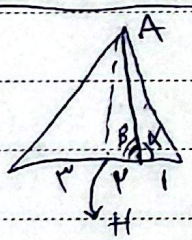
$\tan\alpha = \frac{x}{3}$ ، $\tan 2\alpha = \frac{2}{x}$

$\tan 2\alpha = \frac{2\tan\alpha}{1 - \tan^2\alpha} \Rightarrow \frac{2}{x} = \frac{2(\frac{x}{3})}{1 - (\frac{x}{3})^2} \Rightarrow \frac{2}{x} = \frac{\frac{2x}{3}}{\frac{9 - x^2}{9}} \Rightarrow \frac{2}{x} = \frac{6x}{9 - x^2}$

$18 - 2x^2 = 6x^2 \rightarrow 8x^2 = 18 \rightarrow x^2 = \frac{18}{8} \Rightarrow x^2 = \frac{9}{4} \rightarrow x = \frac{3}{2} \Rightarrow \cot\alpha = \frac{3}{\frac{3}{2}} = 2$ ۳

$4 - x^2 = 3$

۴- ارتفاع رسم‌شده کدام رأس بر ضلع روبرو را H می‌نامیم



۲

$AH = \sqrt{(AC)^2 - (CH)^2} = \sqrt{16 - 9} = \sqrt{7}$

$\tan\alpha = \tan(180 - B) = -\tan(B) = -\frac{\sqrt{7}}{2}$

۵- ۲

$2\sin^2 x + \cos^2 x = \frac{4}{3} \rightarrow \sin^2 + \cos^2 + \sin^2 = \frac{4}{3}$

۲

$\sin^2 x = \frac{1}{3} \rightarrow \tan^2 = \frac{\sin^2}{\cos^2} = \frac{\sin^2}{1 - \sin^2} = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$

۴

$$\frac{\sin^4+4\cos^2}{1+\cos^2} - \frac{\cos^4+4\sin^2}{1+\sin^2}$$

(۲)

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

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

$$(2-\sin^2)-(2-\cos^2) = \cos^2-\sin^2 = \cos 2\alpha \checkmark$$

۷

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

$$\cos\left(\frac{5\pi}{2}-\alpha\right) = \cos\left(\frac{4\pi}{2}-\alpha\right) = -\sin\alpha$$

$$\tan\left(\alpha-\frac{3\pi}{2}\right) = -(\cot\alpha) = -\cot\alpha$$

(۲)

$$\left(-\frac{3}{5}\right)^2+\left(+\frac{4}{5}\right)^2+\frac{3}{4}$$

۰/۲۷ ✓

فیثاغورث $\rightarrow x=5 \rightarrow \cos\alpha = -\frac{3}{5}$ $\sin = -\frac{4}{5}$ $\cot\alpha = \frac{3}{4}$

۸

$$2\cos\frac{\pi}{3}+\sqrt{2}\sin\frac{\pi}{12}\sqrt{2}\cos\frac{\pi}{12} = \frac{3}{2}+\sqrt{2}\left(\sin\frac{\pi}{12}\cos\frac{\pi}{12}\right)$$

(۲)

$$A: \sin\frac{\pi}{12}\cos\frac{\pi}{12} \quad A<0 \rightarrow A^2 = \left(\sin\frac{\pi}{12}\cos\frac{\pi}{12}\right) = \sin^2\frac{\pi}{12}+\cos^2\frac{\pi}{12}$$

$$-2\sin\frac{\pi}{12}\cos\frac{\pi}{12} \rightarrow A^2 = 1-\sin\frac{\pi}{6} = 1-\frac{1}{2} = \frac{1}{2} \rightarrow A = -\frac{1}{\sqrt{2}}$$

$$\frac{3}{2}+\sqrt{2}\left(\sin\frac{\pi}{12}-\cos\frac{\pi}{12}\right) = \frac{3}{2}+\sqrt{2}\times\left(-\frac{1}{\sqrt{2}}\right) = \frac{3}{2}-1 = \frac{1}{2} \checkmark$$

۹

$$\tan\alpha = \frac{2\tan\frac{\alpha}{2}}{1-\tan^2\frac{\alpha}{2}} = \frac{2\left(\frac{1}{4}\right)}{1-\frac{1}{16}} = \frac{\frac{1}{2}}{\frac{15}{16}} = \frac{8}{15}$$

(۲)

$\sin = \frac{8}{17}$

$\cos = \frac{15}{17}$

$$\frac{\tan-\sin}{\sin-\cos} = \frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}} = \frac{8(17-15)}{15} = -\frac{16}{15}$$

$-\frac{7}{17}$

NOTEBOOK

$2\sin\alpha < \sin 2\alpha \rightarrow 2\sin\alpha < 2\sin\alpha\cos\alpha$ (۲) ـ ۱۰

$2\sin\alpha - 2\sin\alpha\cos\alpha < 0 \rightarrow 2\sin\alpha(1-\cos\alpha) < 0$

(همواره مثبت)

$\sin\alpha < 0 \longrightarrow$ ربع چهارم ✓

$\cos\alpha > 1$