

کلاس: دهم > قدرانه A

18170

آینا سُکری

الف) $\tan \frac{11\pi}{4} + \sin \frac{15\pi}{4} \cos \frac{13\pi}{4} =$

$$-1 + \frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2} = -1 + \frac{2}{4} = -1 + \frac{1}{2} = -\frac{1}{2}$$

ب) $\tan \frac{11\pi}{4} \sin \frac{11\pi}{4} + \cos \frac{10\pi}{4} =$

$$\tan 2\pi + \frac{5\pi}{4} \times \sin 2\pi + \frac{5\pi}{4} + \cos 2\pi + \frac{\pi}{2} = -\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2} + -\frac{1}{2} = \frac{2}{4} - \frac{1}{2} = 0$$

$\cot x = 4$ $\frac{4\cos x - \sin x}{\cos x + \sin x} \div \sin x = \frac{4\cot x - 1}{\cot x + 1} = \frac{4 \times 4 - 1}{4 + 1} = \frac{15}{5} = 3$

$\sin a = 4\cos a$ $\cos a = ? = \sqrt{-\frac{1}{15}}$

$(4\cos a)^2 + \cos^2 a = 1 \rightarrow 16\cos^2 a + \cos^2 a = 17\cos^2 a = 1$

$\cos^2 a = \frac{1}{17}$ $\cos a = \pm \frac{1}{\sqrt{17}}$

الف) $\cos(\frac{11\pi}{4} + a) = \cos(2\pi + \frac{5\pi}{4} + a) \stackrel{11}{=} \cos a \cos \frac{5\pi}{4} - \sin a \sin \frac{5\pi}{4}$

$$\cos a = -\sqrt{1 - (\frac{\sqrt{2}}{10})^2} = -\sqrt{1 - \frac{2}{100}} = -\sqrt{\frac{98}{100}} = -\frac{\sqrt{98}}{10}$$

$$\rightarrow (-\frac{\sqrt{98}}{10}) (-\frac{\sqrt{2}}{10}) - (\frac{\sqrt{2}}{10}) (\frac{\sqrt{2}}{10}) = \frac{\sqrt{196}}{100} - \frac{2}{100} = \frac{194}{100} = \frac{97}{50}$$

ب) $\sin(\frac{13\pi}{4} + a) = \sin(3\pi + \frac{\pi}{4} + a) = \sin a \cos \frac{\pi}{4} + \cos a \sin \frac{\pi}{4}$ $\sqrt{1^2 + 1^2} = \sqrt{2}$

$\sin \frac{13\pi}{4} = -\sin \frac{\pi}{4} = -\frac{\sqrt{2}}{2}$ / $\cos \frac{13\pi}{4} = -\cos \frac{\pi}{4} = -\frac{\sqrt{2}}{2}$ / $\cos a = \frac{1}{\sqrt{50}}$, $\sin a = \frac{1}{\sqrt{50}}$

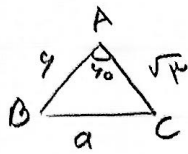
$\sin a \cos \frac{\pi}{4} + \cos a \sin \frac{\pi}{4} = (-\frac{\sqrt{2}}{2}) (\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}) = -\frac{\sqrt{2}}{2} \times \frac{2\sqrt{2}}{2} = -1$

$4\sin^2 x + \cos^2 x = \frac{5}{4}$ $\sin^2 x + 1 = \frac{5}{4}$ $\sin^2 x = \frac{1}{4}$

$\cos^2 x = 1 - \frac{1}{4} = \frac{3}{4}$ $\tan^2 x = \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{3}$

$$S = \frac{1}{2} \times 4 \times \sqrt{3} = 2\sqrt{3}$$

ضلع‌ها $a, 4, \sqrt{3}$



$$S = \frac{1}{2} \times 4 \times \sqrt{3} \times \sin \hat{A} = 2\sqrt{3} \rightarrow \sin \hat{A} = \frac{\sqrt{3}}{4}$$

$$\frac{a}{\sin \hat{A}} = \frac{4}{\sin \hat{C}} = \frac{\sqrt{3}}{\sin \hat{B}}$$

$$\sin \hat{C} = \frac{2\sqrt{3}}{a} = \frac{\sin \hat{B} \times 4}{\sqrt{3}}$$

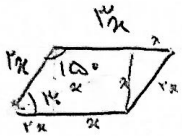
$$a = \sqrt{(\sqrt{3})^2 + 4^2 - 2 \times 4 \times \sqrt{3} \cos \hat{A}} =$$

$$(40^\circ) \rightarrow a = \sqrt{3 + 16 - 12\sqrt{3} \times \frac{1}{4}} = \sqrt{13 - 3\sqrt{3}}$$

$$(140^\circ) \rightarrow a = \sqrt{3 + 16 + 12\sqrt{3} \times \frac{1}{4}} = \sqrt{19 + 3\sqrt{3}}$$

$$\frac{a_{\max}}{a_{\min}} = \frac{\sqrt{19 + 3\sqrt{3}}}{\sqrt{13 - 3\sqrt{3}}} = \frac{19 + 3\sqrt{3}}{\sqrt{13 - 3\sqrt{3}}}$$

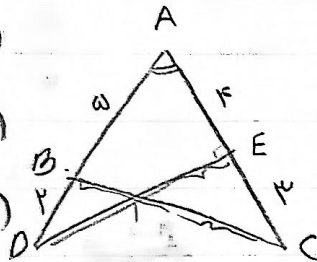
نسبت اوجها



$$\text{مساحت} = \frac{1}{2} \times \text{ارتفاع} \times \text{پایه} = \frac{1}{2} \times 10k \times 10k = 50k^2$$

$$k^2 = 18 \quad k = \sqrt{18}$$

$$\text{پاس} = 10k + 10k + 10k + 10k = 40k = 40\sqrt{18} = 20\sqrt{72}$$



$$\text{اقلان مساحت} = 1, \sqrt{3}$$

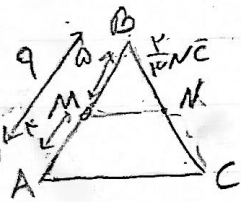
$$\tan \hat{A} = ?$$

$$S_{ADE} = \frac{1}{2} \times 1 \times 1 \times \sin \hat{A} = \frac{1}{2} \sin \hat{A}$$

$$S_{ABC} = \frac{1}{2} \times 2 \times 2 \times \sin \hat{A} = 2 \sin \hat{A}$$

$$2 \sin \hat{A} - \frac{1}{2} \sin \hat{A} = \frac{3}{2} \sin \hat{A} = 1 \rightarrow \sin \hat{A} = \frac{1}{2} \rightarrow \hat{A} = 30^\circ$$

$$\tan \hat{A} = \frac{1}{\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{1}{\sqrt{3}}$$



$$2 \cdot \overline{BN} = \overline{NC}$$

$$\frac{1}{2} + 1 = \frac{1}{2} \cdot \overline{NC}$$

$$\frac{BM}{AM} = ?$$

$$\frac{S_{ABC}}{S_{BMN}} = \frac{AB \times BC}{BM \times BN} = \frac{AB}{BM} \times \frac{1}{2} = 2$$

$$\frac{AB}{BM} = \frac{4}{1}$$

$$\frac{BM}{AM} = \frac{1}{3} = \frac{1}{3}$$

$$\frac{|\sin a|}{\cos a} = -\frac{1}{\cot a} \Rightarrow -\frac{\sin a}{\cos a} \rightarrow \sin a < 0$$

$$\sin a < 0$$

چون $|\sin a|$ برابر $\sin a$ است

پس $\sin a$ منفی است

$$\frac{1}{\sqrt{\cos^2 a}} - \tan a = \frac{1 + \sin a}{1 \cos a} \rightarrow \frac{1}{\cos a} - \frac{\sin a}{\cos a} \rightarrow \cos a > 0$$

$$-\frac{\sin a}{\cos a} = \frac{\sin a}{\cos a}$$

$$\cos a > 0$$

چون $1 + \sin a$ برابر $\sin a$ است

و $|\cos a|$ منفی است پس $\cos a$ مثبت است