

نام و نام خانوادگی: ...
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 ۲. از این ضمیمه قوت نوشتی ...
 گروه: ...
 سر: ...

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الف) $27^\circ = (x) \text{ rad}$ $\frac{27}{180} = \frac{x \text{ rad}}{\pi} \Rightarrow 180 \text{ rad} = 27\pi \Rightarrow \text{rad} = \frac{180}{27} \pi = x$

ب) $125^\circ = (x) \text{ rad}$ $\frac{125}{180} = \frac{x \text{ rad}}{\pi} \Rightarrow 180 \text{ rad} = 125\pi \Rightarrow \text{rad} = \frac{180}{125} \pi = x$

ج) $\frac{5\pi}{12} \text{ rad} = (x)^\circ$ $\frac{D}{180} = \frac{5\pi}{12} \Rightarrow 12D = 900 \Rightarrow D = 75^\circ = x$

د) $\frac{4\pi}{9} \text{ rad} = (x)^\circ$ $\frac{D}{180} = \frac{4\pi}{9} \Rightarrow 9D = 720 \Rightarrow D = 80^\circ = x$

بهتر است به صورت تقریبی بنویسید!

$\frac{125a}{180} = \frac{D}{180} \Rightarrow 125D = 180a \Rightarrow D = 1.44a$

$\frac{a\pi}{180} = \frac{D}{180} \Rightarrow 180D = 180a \Rightarrow D = a$

$1^\circ a + 1.44a + 1.44a = 180^\circ \Rightarrow 4.88a = 180^\circ \Rightarrow a = 37^\circ$

الف) $\cos 4^\circ \cos 3^\circ - \sin 4^\circ \sin 3^\circ - \tan 4^\circ + 2 \cot 4^\circ =$
 $(\frac{1}{2} \times \frac{\sqrt{3}}{2}) - (\frac{\sqrt{3}}{2} \times \frac{1}{2}) - 1 + 2 = 1$

ب) $\frac{\tan^2 3^\circ + \tan^2 4^\circ + \tan^2 4^\circ}{\cot 3^\circ - \cot 4^\circ} = \frac{\frac{1}{3} + 1 + 3}{\sqrt{3} - \frac{1}{\sqrt{3}}} = \frac{\frac{13}{3}}{\frac{2}{\sqrt{3}}} = \frac{13\sqrt{3}}{6}$

$-\sin 3^\circ \cos 4^\circ + \cos 3^\circ \sin 4^\circ = \sin^2 \theta$

$-\frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} = -\frac{1}{4} + \frac{3}{4} = \frac{2}{4} \Rightarrow \sin^2 \theta = \frac{1}{2} \Rightarrow \sin \theta = \frac{1}{\sqrt{2}}$

$\cos^2 \theta = 1 - \frac{1}{2} \Rightarrow \cos^2 \theta = \frac{1}{2} \Rightarrow \cos \theta = \frac{1}{\sqrt{2}}$

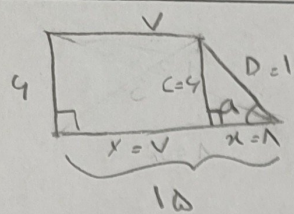
$\tan \theta = \frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}} = 1$

$\frac{2 \tan 3^\circ (1 - \tan^2 3^\circ)}{(1 - \cot^2 4^\circ)^2} = \tan \theta$ $\frac{2 \times \frac{1}{\sqrt{3}} (1 - \frac{1}{3})}{(1 - \frac{1}{3})^2} = \frac{\frac{4}{3\sqrt{3}}}{\frac{4}{9}} = \frac{3}{\sqrt{3}} = \sqrt{3}$

$\tan \theta = \sqrt{3} \Rightarrow \tan^{-1} \sqrt{3} = \frac{1}{\cos \theta} \Rightarrow \frac{1}{\cos \theta} = \sqrt{3} \Rightarrow \cos^2 \theta = \frac{1}{3} \Rightarrow \cos \theta = \frac{1}{\sqrt{3}}$

$\cos^2 \theta + \sin^2 \theta = 1 \Rightarrow \sin^2 \theta = 1 - \frac{1}{3} = \frac{2}{3} \Rightarrow \sin \theta = \frac{\sqrt{2}}{\sqrt{3}}$ $\frac{40}{180} = \frac{\text{rad}}{\pi} \Rightarrow 40\pi = 180 \text{ rad} \Rightarrow \text{rad} = \frac{\pi}{4.5} = \theta$

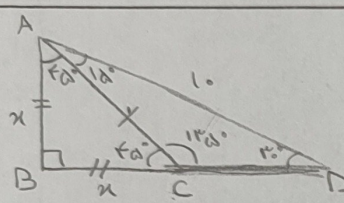
$$\frac{r \sin \theta - \cos \theta}{\sin \theta - r \cos \theta} \div \cos \theta = \frac{\frac{r \sin \theta}{\cos \theta} - \frac{\cos \theta}{\cos \theta}}{\frac{\sin \theta}{\cos \theta} - \frac{r \cos \theta}{\cos \theta}} = \frac{r \tan \theta - 1}{\tan \theta - r} = \frac{10 - 1}{10 - r} = 1r$$



$$\frac{r}{10} = \frac{9}{c} \Rightarrow c = 10 \quad \cos a = \sqrt{1 - \sin^2 a} = \sqrt{1 - \frac{9}{100}} = \frac{r}{10}$$

$$\cos a = \frac{\text{مقابل}}{\text{وتر}} = \frac{x}{c} = \frac{r}{10} = \frac{x}{10} \Rightarrow x = 1$$

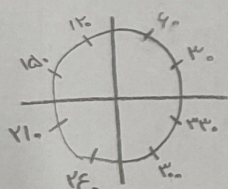
$$k_{\text{سو}} = 9 + 10 + 10 + 10 = 39$$



$$\frac{DC}{\sin(\angle CAD)} = \frac{AD}{\sin(\angle ACB)} \Rightarrow \frac{DC}{\sin 15^\circ} = \frac{10}{\sin 15^\circ} \Rightarrow DC = 10 \cdot \frac{\sin 15^\circ}{\sin 15^\circ} \Rightarrow DC = 10$$

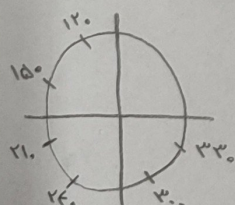
$$10 \cdot \frac{\sqrt{4} - \sqrt{2}}{\sqrt{2}} \Rightarrow DC = 10(\sqrt{2} - 1)$$

$$\sin 15^\circ = \sin(45^\circ - 30^\circ) = \sin 45^\circ \cos 30^\circ - \cos 45^\circ \sin 30^\circ = \frac{\sqrt{4} - \sqrt{2}}{2}$$



$$\sin 30^\circ = \frac{1}{2} \quad \sin 45^\circ = \frac{\sqrt{2}}{2} \quad \text{X ناصب}$$

$$\left. \begin{aligned} \sin 210^\circ &= -\frac{1}{2} & \sin 240^\circ &= -\frac{\sqrt{3}}{2} \\ \cos 210^\circ &= -\frac{\sqrt{3}}{2} & \cos 240^\circ &= -\frac{1}{2} \end{aligned} \right\} \text{X ناصب}$$



$$\sin 30^\circ = -\frac{\sqrt{3}}{2} \quad \sin 33^\circ = -\frac{1}{2} \quad \text{X ناصب}$$

$$\left. \begin{aligned} \sin 12^\circ &= \frac{\sqrt{3}}{2} & \sin 15^\circ &= \frac{1}{2} \\ \cos 12^\circ &= -\frac{1}{2} & \cos 15^\circ &= -\frac{\sqrt{3}}{2} \end{aligned} \right\} \text{X ناصب}$$

$$\tan x = \frac{1}{r}$$

$$\text{X ناصب} \rightarrow \sin \angle, \cos \angle$$

$$\tan^r x = \frac{1}{\cos^r x} \Rightarrow \frac{1}{9} = \frac{1}{\cos^r x} \Rightarrow \frac{1}{9} = \frac{1}{\cos^r x} \Rightarrow 9 = 10 \cos^r x \Rightarrow \cos^r x = \frac{9}{10}$$

$$\sin^r x = 1 - \cos^r x \Rightarrow \sin^r x = 1 - \frac{9}{10} \Rightarrow \sin^r x = \frac{1}{10} \Rightarrow \sin x = \frac{1}{\sqrt{10}} \quad \text{X}$$

$$\sin x = -\frac{\sqrt{10}}{10} \quad \text{✓}$$

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