

الف) $27^\circ = (n) \text{ Rad}$ $\frac{27}{180} = \frac{\text{Rad}}{\pi} \rightarrow = \frac{3\pi}{20} \text{ Rad}$ $1) \frac{3\pi}{9} \text{ rad} = (n)^\circ$
 $\frac{3\pi}{9} = \frac{n}{180}$
 $\frac{n}{180} = \frac{3}{9} \rightarrow n = 1^\circ$

ب) $135^\circ = (n) \text{ Rad}$ $\frac{135}{180} = \frac{\text{Rad}}{\pi} \rightarrow = \frac{3\pi}{4} \text{ Rad}$

ج) $\frac{5\pi}{12} \text{ rad} = (n)^\circ$ $\frac{5\pi}{12} = \frac{n}{180} \rightarrow \frac{n}{180} = \frac{5}{12} \rightarrow n = 75^\circ$

$\frac{120a}{9} = 120a^\circ$ $\frac{120a}{9} \times \frac{180}{180} = 120a^\circ$

$\frac{a\pi}{1} \text{ Rad} = 120a^\circ$ $10a + 120a + 120a = 110^\circ$
 $120a = 110 \rightarrow a = 1^\circ$

$\frac{a\pi}{1} \times \frac{180}{\pi} = \frac{120a}{1} = 120a^\circ$

الف) $\cos 4^\circ \cos 3^\circ - \sin 4^\circ \sin 3^\circ - \tan 4^\circ + \cot 4^\circ$

$\frac{1}{2} \times \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} \times \frac{1}{2} - 1 + 1 = 1$

ب) $\frac{\frac{1}{3} + 1 + 3}{\sqrt{3} - \frac{\sqrt{3}}{3}} = \frac{\frac{13}{3}}{\frac{2\sqrt{3}}{3}} = \frac{13}{2\sqrt{3}}$ $\frac{\tan^2 3^\circ + \tan^2 4^\circ + \tan^2 5^\circ}{\cot^2 3^\circ - \cot^2 4^\circ}$

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

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

$-\frac{1}{4} + \frac{3}{4} = \sin^2 \theta \rightarrow \sin^2 \theta = \frac{1}{2}$ $\sin \theta = \frac{\sqrt{2}}{2}$
 $\theta = 45^\circ \rightarrow \tan 45^\circ = 1$

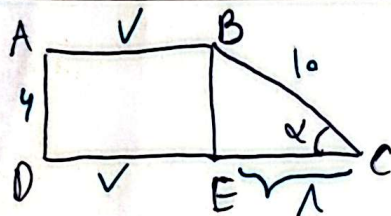
$\frac{2 \tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \cot^2 40^\circ)^2} = \frac{\frac{2\sqrt{3}}{3} (1 - \frac{1}{3})}{(1 - \frac{1}{3})(1 - \frac{1}{3})} = \frac{\frac{2\sqrt{3}}{3}}{\frac{4}{9}} = \sqrt{3}$

$\frac{y_0}{180} = \frac{\text{Rad}}{\pi} \rightarrow y_0^\circ = \frac{\pi}{\sqrt{3}} \text{ rad}$ $\tan \theta = \sqrt{3}$
 $\theta = 60^\circ$

$$\tan \theta = 5 \rightarrow \frac{\sin \theta}{\cos \theta} = 5 \rightarrow \sin \theta = 5 \cos \theta$$

$$\frac{1 \sin \theta - \cos \theta}{\sin \theta - 5 \cos \theta} = \frac{1 \cdot 5 \cos \theta - \cos \theta}{5 \cos \theta - 5 \cos \theta} = \frac{4 \cos \theta}{0} = \text{undefined}$$

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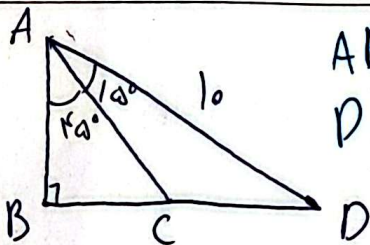


$$\sin \alpha = \frac{BE}{BC} = \frac{4}{10} \rightarrow \frac{4}{BC} = \frac{4}{10} \rightarrow BC = 10$$

$$\cos \alpha = \frac{EC}{BC} = \frac{1}{10} \rightarrow \frac{EC}{10} = \frac{1}{10} \rightarrow EC = 1$$

$$\text{مساحت: } 4 + 4 + 1 + 1 + 10 = 20$$

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$$AB = BC = AC (\cos(45^\circ)) = 10 \left(\frac{1}{\sqrt{2}}\right) = 5\sqrt{2}$$

$$DC = BD - BC = 10 (\sin 45^\circ) = 5\sqrt{2} = 5\sqrt{2} - 5$$

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الف) افزایش $\theta \leftarrow \sin$ کاهش $\leftarrow$ در نامیه ۳ و ۲
 $\leftarrow \cos$ افزایش $\leftarrow$ در نامیه ۳ و ۲
 ربع ۳ (افزایش $\sin$ و کاهش $\cos$)

ب) افزایش $\theta \leftarrow \sin$ کاهش $\leftarrow$ در نامیه ۳ و ۲
 $\leftarrow \cos$ کاهش $\leftarrow$ در نامیه ۱ و ۲
 ربع ۲ (کاهش $\sin$ و $\cos$)

$$\tan n = \frac{1}{3} \rightarrow \frac{\sin n}{\cos n} = \frac{1}{3} \rightarrow \cos n = 3 \sin n$$

$$\frac{1}{\cos^2 n} = 1 + \tan^2 n$$

$$\frac{1}{\cos^2 n} = 1 + \left(\frac{1}{3}\right)^2 \rightarrow \cos^2 n = \frac{9}{10}$$

$$\rightarrow \cos^2 n = \frac{9}{10} \rightarrow \sin^2 n + \cos^2 n = 1$$

$$\sin^2 n = \frac{1}{10}$$

$$\sin n = \pm \sqrt{\frac{1}{10}} = \pm \frac{1}{\sqrt{10}} = \pm \frac{\sqrt{10}}{10}$$

چون اینها در ربع سوم است پس $\sin n$ تنها برابر $-\frac{\sqrt{10}}{10}$ است.