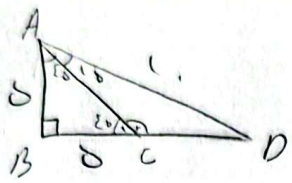
(۸)



$A = 90^\circ \rightarrow \begin{cases} \frac{BD}{AD} = \frac{\sqrt{3}}{2} \rightarrow BD = 5\sqrt{3} \\ \frac{AB}{AD} = \frac{1}{2} \rightarrow AB = 5 \end{cases}$

$DC = 5\sqrt{3} - 5$

$A_1 = C_1 = 45 \rightarrow AB = BC = 5$

(۲) ✓

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(۹)

$\cos\theta$ کم $\rightarrow$ $\sin\theta$ زیاد $\rightarrow$ θ زیاد

$\sin\theta$ کم $\rightarrow$ $\cos\theta$ زیاد $\rightarrow$ فاصله ۳

ناحیه ۱ و ۳ — $\cos\theta$ کم $\rightarrow$ $\sin\theta$ کم

ناحیه ۲ و ۳ — $\sin\theta$ کم

(۲) ✓

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(۱۰)

$\tan x = \frac{\sin x}{\cos x} = \frac{1}{3} \rightarrow \cos x = 3\sin x$, $\sin x < 0$, $\cos x < 0$

ناحیه ۳

$\sin^2 x + \cos^2 x = 1 \rightarrow \sin^2 x + 9\sin^2 x = 10\sin^2 x = 1$

$\sin x = -\frac{\sqrt{10}}{10}$ ← ناحیه ۳ و $\sin x$ منفی

(۲) ✓

امیدی زوین

۱)

الف) $\frac{D}{180} = \frac{Rad}{\pi} \rightarrow \frac{270}{180} = \frac{Rad}{\pi} \rightarrow \boxed{\frac{3\pi}{2}}$

ب) $\frac{135}{180} = \frac{Rad}{\pi} \rightarrow \boxed{\frac{3\pi}{4}}$

ج) $\frac{D}{180} = \frac{\frac{5\pi}{12}}{\frac{\pi}{1}} = \frac{5 \times 180}{12} = 75^\circ$

د) $\frac{D}{180} = \frac{\frac{4\pi}{9}}{\frac{\pi}{1}} = \frac{4 \times 180}{9} = \boxed{80^\circ}$

(۲) ✓ ۲۰

۲)

$\frac{\frac{125a}{9}}{200} = \frac{D}{180} \rightarrow \frac{1250}{1800} = \frac{D}{180} \rightarrow D = \frac{125 \times 180}{10} = 12.5a$

$\frac{\frac{a\pi}{8}}{\pi} = \frac{D}{180} \Rightarrow D = \frac{a \times 180}{8} = 22.5a$

$10a$

$22.5a + 12.5a + 10a = 180$

$45a = 180$

$a = \frac{180}{45} = \boxed{4^\circ}$

(۲) ✓

۳)

الف) $\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ - \tan 45^\circ + 2\cot 45^\circ = 0 + \cot 45 = \boxed{1}$

$\sin 60 = \cos 30 , \sin 30 = \cos 60 \rightarrow$

$\cos 60 \cos 30 = \sin 60 \sin 30$

$\cos 60 \cos 30 - \sin 60 \sin 30 = 0$

$\cot 45 = \tan 45$

$-\tan 45 + 2\cot 45 = \cot 45$

(۲) ✓

ب) $\frac{\tan^2 30 + \tan^2 45 + \tan^2 60}{\cot 30 - \cot 60} = \frac{\left(\frac{1}{\sqrt{3}}\right)^2 + 1 + (\sqrt{3})^2}{(\sqrt{3}) - \left(\frac{1}{\sqrt{3}}\right)} = \frac{\frac{13}{3}}{\frac{2}{\sqrt{3}}} = \frac{13\sqrt{3}}{6}$

۴)

$-\sin 30 . \cos 60 + \cos 30 . \sin 60 = \sin^2\theta \Rightarrow -\sin^2 30 + \cos^2 30 = -\left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 = \frac{2}{4} \Rightarrow \sin\theta = \pm\frac{\sqrt{2}}{2}$

$\theta = 45^\circ \rightarrow \tan 45 = \frac{\sin 45}{\cos 45} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$

چون زاویه حاده (+) قابل قبول

(۲) ✓

۵)

$\frac{2\tan 30 (1 - \tan^2 30)}{(1 - \cot^2 60)^2} = \tan\theta \rightarrow \frac{2\left(\frac{1}{\sqrt{3}}\right)\left(1 - \left(\frac{1}{\sqrt{3}}\right)^2\right)}{\left(1 - \left(\frac{1}{\sqrt{3}}\right)^2\right)^2} = \frac{\frac{1}{\sqrt{3}}}{\frac{1}{3}} = \sqrt{3} = \tan\theta \rightarrow \theta = 60^\circ$ حاده

$\frac{\pi}{3} Rad$

(۲) ✓

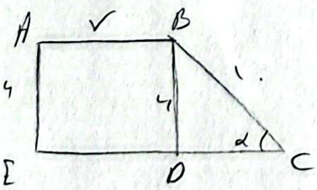
۶)

$\tan\theta = 5 \rightarrow \frac{\sin\theta}{\cos\theta} = 5 \rightarrow \sin\theta = 5\cos\theta \rightarrow \frac{3\sin\theta - \cos\theta}{\sin\theta - 4\cos\theta} = \frac{15\cos\theta - \cos\theta}{5\cos\theta - 4\cos\theta}$

$\frac{14\cos\theta}{\cos\theta} = 14$

(۲) ✓

۷)



$\rightarrow \frac{BD}{BC} = \frac{6}{10} \rightarrow DC = \sqrt{10^2 - 6^2} = \sqrt{64} = 8$

$P = 6 + 7 + 10 + 8 + 7 = 38$

(۲) ✓