آفرین خیلی خوب نوشتی 19,25

سامیار داودی — تکلیف ۱۶ — دهم دختر B

(۱ ۲

الف) $27^\circ = (x)rad \rightarrow \frac{27}{180} = \frac{x}{\pi} \rightarrow \frac{27\pi}{180} = \frac{3\pi}{20} rad \rightarrow \boxed{x = \frac{3\pi}{20}}$

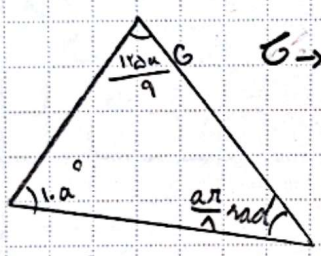
ب) $125^\circ = (x)rad \rightarrow \frac{125}{180} = \frac{x}{\pi} \rightarrow \frac{125\pi}{180} = \frac{25\pi}{36} rad \rightarrow \boxed{x = \frac{25\pi}{36}}$

ج) $\frac{5\pi}{12} rad = (x)^\circ \rightarrow \frac{\frac{5\pi}{12}}{\pi} = \frac{x}{180} \rightarrow \frac{5}{12} = \frac{x}{180} \rightarrow \frac{180 \times 5}{12} = 75^\circ \rightarrow \boxed{x = 75^\circ}$

د) $\frac{4\pi}{9} rad = (x)^\circ \rightarrow \frac{\frac{4\pi}{9}}{\pi} = \frac{x}{180} \rightarrow \frac{4}{9} = \frac{x}{180} \rightarrow \frac{4 \times 180}{9} = 80^\circ \rightarrow \boxed{x = 80^\circ}$

علامت درجه‌ها را حتما بنویس!

(۲



$G \rightarrow D \rightarrow \frac{\frac{125a}{9}}{200} = \frac{D}{180} \rightarrow \frac{25a}{360} = \frac{D}{180} \rightarrow \frac{25a \times 180}{360} = (12,5a)^\circ$

۲

$rad \rightarrow D \rightarrow \frac{\frac{ar}{8}}{\pi} = \frac{D}{180} = \frac{a}{8} = \frac{D}{180} \rightarrow \frac{180a}{8} = (22,5a)^\circ$

$(10a)^\circ + (12,5a)^\circ + (22,5a)^\circ = 180^\circ \rightarrow (45a)^\circ = 180^\circ \rightarrow a = \frac{180}{45} \rightarrow$

$\boxed{a = 4}$ ✓

(۳

الف) $\overbrace{\cos 45^\circ}^{\frac{1}{2}} \overbrace{\cos 30^\circ}^{\frac{\sqrt{3}}{2}} - \overbrace{\sin 45^\circ}^{\frac{\sqrt{3}}{2}} \overbrace{\sin 30^\circ}^{\frac{1}{2}} - \overbrace{\tan 45^\circ}^{1} + 2\overbrace{\cot 45^\circ}^{1} =$

۲

$\frac{\sqrt{3}}{4} - \frac{\sqrt{3}}{4} - 1 + 2 = \boxed{1}$

ب) $\frac{\overbrace{\tan^2 30^\circ}^{\frac{1}{3}} + \overbrace{\tan^2 45^\circ}^{1} + \overbrace{\tan^2 60^\circ}^{3}}{\frac{\cot 30^\circ}{\sqrt{3}} - \frac{\cot 60^\circ}{\frac{1}{\sqrt{3}}}} = \frac{\frac{1}{3} + \frac{3}{3} + \frac{9}{3}}{\frac{2}{\sqrt{3}}} = \frac{\frac{13}{3}}{\frac{2}{\sqrt{3}}} = \boxed{\frac{13\sqrt{3}}{6}}$ ✓

$\theta < 90^\circ$

(۴

$$\underbrace{-\sin 30^\circ}_{-\frac{1}{2}}\underbrace{\cos 60^\circ}_{\frac{1}{2}} + \underbrace{\cos 30^\circ}_{\frac{\sqrt{3}}{2}}\underbrace{\sin 60^\circ}_{\frac{\sqrt{3}}{2}} = \sin^2\theta$$

۲

$$\left(-\frac{1}{2}\times\frac{1}{2}\right) + \left(\frac{\sqrt{3}}{2}\times\frac{\sqrt{3}}{2}\right) = -\frac{1}{4} + \frac{3}{4} = \frac{2}{4} \qquad \sin^2\theta = \frac{2}{4}$$

$$\sin\theta = \frac{\sqrt{2}}{2} \Rightarrow \theta = 45^\circ$$

$$\boxed{\tan\theta = \tan 45^\circ = 1} \checkmark$$

(۵

$\theta < 90^\circ$

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

$\tan 30^\circ = \frac{1}{\sqrt{3}}$, $\tan^2 30^\circ = \frac{1}{3}$, $\cot 60^\circ = \frac{1}{\sqrt{3}}$, $\cot^2 60^\circ = \frac{1}{3}$

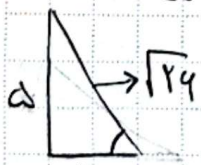
۲

$$\frac{\frac{2}{\sqrt{3}}\times\frac{2}{3}}{\left(\frac{2}{3}\right)^2} = \frac{\frac{4}{3\sqrt{3}}}{\frac{4}{9}} = \frac{9}{3\sqrt{3}} = \frac{3}{\sqrt{3}} = \frac{\sqrt{9}}{\sqrt{3}} = \sqrt{3}$$

$$\boxed{\tan\theta = \sqrt{3} \rightarrow \theta = 60^\circ \rightarrow \theta = \frac{\pi}{3}\,rad} \checkmark$$

(۶

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



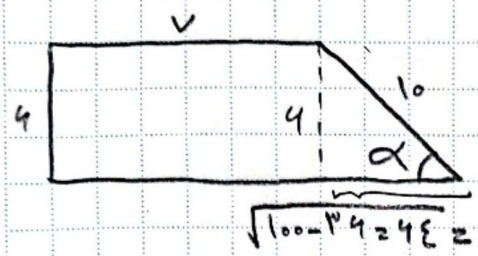
۲

$$\frac{3\sin\theta - \cos\theta}{\sin\theta - 4\cos\theta} = \frac{3\left(\frac{5}{\sqrt{24}}\right) - \left(\frac{1}{\sqrt{24}}\right)}{\left(\frac{5}{\sqrt{24}}\right) - 4\left(\frac{1}{\sqrt{24}}\right)} = \frac{\frac{15-1}{\sqrt{24}}}{\frac{5-4}{\sqrt{24}}} \rightarrow$$

$$\frac{\frac{14}{\sqrt{24}}}{\frac{1}{\sqrt{24}}} = \boxed{14} \checkmark$$

۷) ۲

$\sin\alpha = \frac{۶}{۱۰}$



$\text{محیط ذوزنقه} = ۶+۱۰+۷+(۷+۸) = ۳۸$

$\boxed{\text{محیط ذوزنقه} = ۳۸}$ ✓

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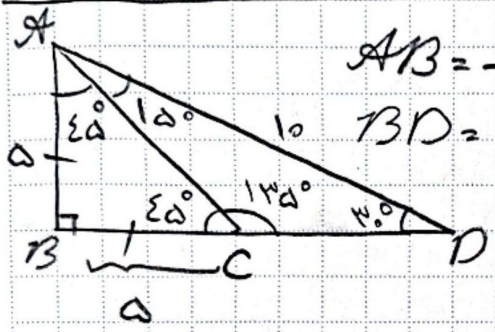
۸) ۲



$AB = \frac{۱}{۲}(۱۰) = ۵$

$BD = \frac{\sqrt{۳}}{۲}(۱۰) = \sqrt{۷۵}$ → بیرون از فیثاغورس هرچه دست آورد

$CD = \sqrt{۷۵} - ۵ = \boxed{۵\sqrt{۳}-۵} = ۳,۶۶\ldots$ ✓

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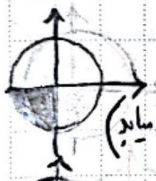
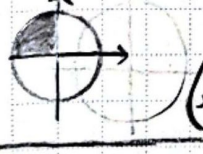
۹) ۲

الف) ناحیه سوم ★ (چون sin و cos منفی هستند با افزایش زاویه sin کاهش و cos افزایش می‌یابد)



ب) ناحیه دوم ★ (ذیل ناحیه ۲ با افزایش زاویه sin کاهش می‌یابد دور cos افزایش ولی چون cos منفی است پس هردو کاهش می‌یابند)



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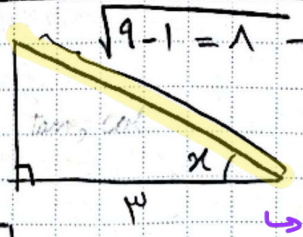
۱۰) ۲

$\tan\alpha = \frac{۱}{۳}$

cos, sin = منفی

tan, cot = مثبت



$\sqrt{۱^۲+۳^۲} = \sqrt{۱۰}$

۱,۲۵

$\boxed{\sin\alpha = \frac{\text{ضلع مقابل}}{\text{وتر}} = \frac{۱}{\sqrt{۸}}}$

$\sin\alpha = \frac{\text{ضلع مقابل}}{\text{وتر}} = \frac{-۱}{\sqrt{۱۰}} = \frac{-\sqrt{۱۰}}{۱۰}$