نام و نام خانوادگی ..کیارش بشیرانی....... پاسخنامه تشریحی تکلیف شماره ..۱۶.. کلاس ...دهم تجربی...B...

۱

الف) $x = 27 \times \frac{\pi}{180} = \frac{3\pi}{20} \Rightarrow 27^\circ = \frac{3\pi}{20}\, rad$

ب) $x = 125 \times \frac{\pi}{180} = \frac{25\pi}{36} \Rightarrow 125^\circ = \frac{25\pi}{36}\, rad$

ج) $x = \frac{5\pi}{12} \times \frac{180}{\pi} = 75^\circ \Rightarrow \frac{5\pi}{12}\, rad = 75^\circ$

د) $x = \frac{4\pi}{9} \times \frac{180}{\pi} = 80^\circ \Rightarrow \frac{4\pi}{9}\, rad = 80^\circ$

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$\frac{G}{200} = \frac{D}{180} \Rightarrow D = \frac{9}{10} G = \frac{9}{10} \times \frac{125a}{9} = 12.5a^\circ$

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

$10a + 12.5a + 22.5a = 180^\circ \Rightarrow 45a = 180^\circ \Rightarrow \boxed{a = 4^\circ}$

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الف) $\cos 60^\circ = \sin 30^\circ \quad , \quad \sin 60^\circ = \cos 30^\circ \Rightarrow$

$\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ - \tan^2 45^\circ + 2\cot 45^\circ = -1 + 2 = 1$

ب) $\tan 60^\circ = \cot 30^\circ = \frac{\cos 30}{\sin 30} = \frac{\frac{\sqrt3}{2}}{\frac12} = \sqrt3 \qquad \cot 60 = \tan 30 = \frac{\sin 30}{\cos 30} = \frac{\sqrt3}{3}$

$\Rightarrow \frac{(\frac{\sqrt3}{3})^2 + 1^2 + (\sqrt3)^2}{\sqrt3 - \frac{\sqrt3}{3}} = \frac{\frac13 + 1 + 3}{\sqrt3(1 - \frac13)} = \frac{\frac{13}{3}}{\sqrt3 \times \frac23} \xrightarrow{\times\sqrt3} = \frac{\frac{13\sqrt3}{3}}{2} = \frac{13\sqrt3}{6}$

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$\left.\begin{array}{l}\cos 60^\circ = \sin 30^\circ \\ \cos 30^\circ = \sin 60^\circ\end{array}\right\} \Rightarrow -\sin^2 30^\circ + \sin^2 60^\circ = \sin^2\theta \Rightarrow \sin^2\theta = -\frac14 + \frac34 = \frac12$

$\Rightarrow 1 - \cos^2\theta = \frac12 \Rightarrow \cos^2\theta = \frac12 \qquad 1 + \tan^2\theta = \frac{1}{\cos^2\theta} = \frac{1}{\frac12} = 2 \Rightarrow$

$\tan^2\theta = 1 \xrightarrow{\theta \text{ زاویه حاده است}} \boxed{\tan\theta = 1}$

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$\cot 60^\circ = \tan 30^\circ \Rightarrow 1 - \cot^2 60^\circ = 1 - \tan^2 30^\circ \Rightarrow$

$\frac{2\tan 30^\circ (1 - \tan^2 30^\circ)}{(1 - \tan^2 30^\circ)^2} = \tan\theta \Rightarrow \tan\theta = \frac{2\tan 30^\circ}{1 - \tan^2 30^\circ} = \frac{2 \times \frac{\sqrt3}{3}}{1 - \frac13} = \frac{\frac{2\sqrt3}{3}}{\frac23} = \sqrt3$

$1 + \tan^2\theta = \frac{1}{\cos^2\theta} \Rightarrow 4 = \frac{1}{\cos^2\theta} \Rightarrow \cos^2\theta = \frac14 \xrightarrow{\theta \text{ حاده است}} \cos\theta = \frac12$

$\sin^2\theta = 1 - \cos^2\theta \Rightarrow \sin^2\theta = 1 - \frac14 = \frac34 \xrightarrow{\theta \text{ حاده است}} \sin\theta = \frac{\sqrt3}{2}$

$\Rightarrow \boxed{\theta = 60^\circ}$

$\frac{D}{180} = \frac{Rad}{\pi} \Rightarrow \frac{60}{180} = \frac{Rad}{\pi} \Rightarrow \boxed{60^\circ = \frac{\pi}{3} Rad} = \theta$

۶

$$\tan\theta = 3 \Rightarrow \frac{\sin\theta}{\cos\theta} = 3 \Rightarrow \sin\theta = 3\cos\theta \Rightarrow$$

$$\frac{2\sin\theta - \cos\theta}{\sin\theta - 4\cos\theta} = \frac{15\cos\theta - \cos\theta}{5\cos\theta - 4\cos\theta} = \frac{14\cancel{\cos\theta}}{\cancel{\cos\theta}} = 14$$

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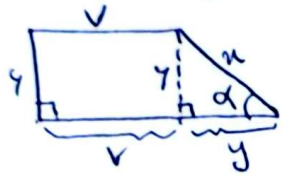


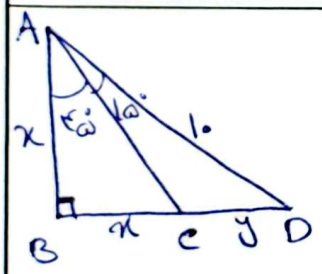
$$\sin\alpha = \frac{۶}{x} = \frac{۶}{۱۰} \Rightarrow x = ۱۰$$

$$y^۲ = ۱۰^۲ - ۶^۲ = ۸^۲ \Rightarrow y = ۸$$

$$P = V + ۱۰ + ۸ + V + ۶ = ۳۸$$

نوزنقه

۸



$$\tan 45^\circ = 1 \Rightarrow AB = BC = x$$

$$\tan 60^\circ = \frac{\sin 60^\circ}{\cos 60^\circ} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3} \Rightarrow \frac{x+y}{x} = \sqrt{3}$$

$$\Rightarrow x + y = \sqrt{3}x$$

$$x^2 + \underbrace{(x+y)^2}_{\sqrt{3}x} = 10^2 \Rightarrow x^2 + 3x^2 = 100 \Rightarrow 4x^2 = 100 \Rightarrow x = 5$$

$$DC = y = x(\sqrt{3} - 1) = 5(\sqrt{3} - 1) = 5\sqrt{3} - 5$$

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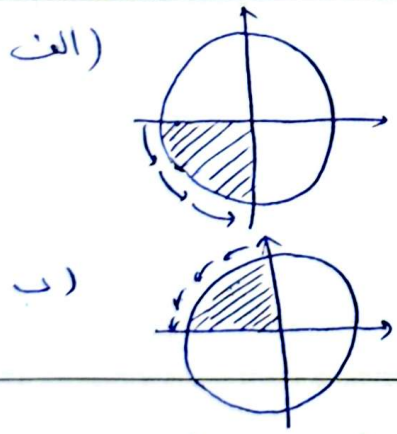

الف) در ناحیهٔ سوم با افزایش θ، مقدار sin کاهش و cos افزایش پیدا می‌کند.

ب) در ناحیهٔ دوم با افزایش θ، مقدار sin و cos هر دو کاهش پیدا می‌کند.

۱۰

$$\tan x = \frac{1}{3} \qquad 1 + \tan^2 x = \frac{1}{\cos^2 x} \Rightarrow 1 + \frac{1}{9} = \frac{1}{\cos^2 x} \Rightarrow$$

$$\cos^2 x = \frac{9}{10} \qquad \sin^2 x = 1 - \cos^2 x = 1 - \frac{9}{10} = \frac{1}{10} \xrightarrow[\sin x < 0]{\text{ناحیهٔ سوم سینوس منفی است}}$$

$$\sin x = -\frac{1}{\sqrt{10}} = -\frac{\sqrt{10}}{10}$$