19,75

نام و نام خانوادگی ...آترین جلیلی... پاسخنامه تشریحی تکلیف شماره ۱۲ کلاس ...دوازدهم تجربی A...

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$\tan\frac{5\pi}{6} = -\frac{\sqrt{3}}{3} = \frac{a(-\frac{\sqrt{3}}{2}) + b(\frac{-\sqrt{3}}{2})}{a(-\frac{1}{2}) + b(\frac{1}{2})} = \frac{-\frac{\sqrt{3}}{2}(a+b)}{-\frac{1}{2}(a-b)} = -\frac{\sqrt{3}}{3}$

$+\frac{\sqrt{3}}{2}(a-b) = -3\frac{\sqrt{3}}{2}(a+b) \to a-b = -3a-3b \to 2b = -4a \to b = -2a$

$\to \frac{b}{a} = \frac{-2a}{a} = \boxed{-2}$ ✓

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$\arccos\frac{1}{2} = 60°$

$P\hat{O}P' = 150°$

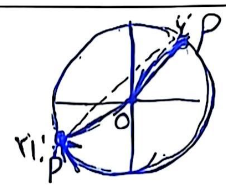
$PO = P'O = 1$

$(PP')^2 = (PO)^2 + (P'O)^2 - 2(PO)(P'O)\cos 150°$

$(PP')^2 = 1 + 1 - 2(-\frac{\sqrt{3}}{2}) = 2+\sqrt{3}$

$\to PP' = \sqrt{2+\sqrt{3}}$

$P_{OPP'} = 2 + \sqrt{2+\sqrt{3}}$ ✓



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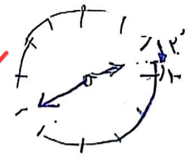
$\frac{\pi}{9} = \frac{180}{9} = 20°$

میزان جابجایی عقربه ساعت شمار همواره نصف مقدار دقیقه است

$\to \frac{M}{2} = 20 \to M = 40 \to 2:40$ ✓



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$\alpha = \left|\frac{11M}{2} - 30H\right| \to 20 = \left|\frac{11M}{2} - 90\right|$

$\to \begin{cases} \frac{11M}{2} - 90 = 20 \to M = 20 & \text{بار دوم} \\ \frac{11M}{2} - 90 = -20 \to M = \frac{140}{11} \simeq 13 & \text{بار اول} \end{cases}$ ✓

بعد از ۲۰ دقیقه زاویه بین دو عقربه برای بار دوم ۲۰ درجه می‌شود

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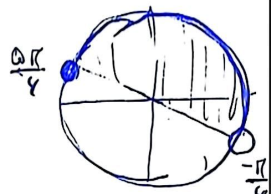
$-\frac{\pi}{6} < x < \frac{5\pi}{6} \to -\frac{1}{2} < \sin x \le 1 \to -\frac{1}{2} < \frac{m-3}{5} \le 1$

$\frac{m-3}{5} \le 1 \to m \le 8$

$-\frac{1}{2} < \frac{m-3}{5} \to 1 > \frac{-2m+6}{5} \to m > \frac{1}{2}$

$\to \frac{1}{2} < m \le 8 \to m = 1, 2, \dots, 8$ ✓



$-\frac{\pi}{6} < x < \frac{5\pi}{6}$

تعداد ۸ عدد صحیح می‌شود ✓

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$$\frac{\sin(\frac{\pi}{2}+10^\circ)+k\cos(\frac{3\pi}{2}-10^\circ)}{\cos(\pi-10^\circ)+2\sin(\pi+10^\circ)}=\frac{\cos 10^\circ+k(-\sin 10^\circ)}{-\cos 10^\circ-2\sin 10^\circ}=3$$ (۴)

$$\xrightarrow{\div\cos 10^\circ}\frac{-3-4\tan 10^\circ}{1-k\tan 10^\circ}=1\rightarrow -3-4\tan 10^\circ=1-k\tan 10^\circ$$

$$\boxed{k=12}\checkmark$$

$$\rightarrow 4=-4\tan 10^\circ+k\tan 10^\circ\rightarrow -4(\tfrac{1}{4})+k(\tfrac{1}{4})=4\rightarrow \tfrac{1}{4}(k-4)=4\rightarrow k-4=16$$

۷

$$\frac{\tan(\frac{\pi}{2}-2)-\cot(\pi-2)}{\cot(\frac{3\pi}{2}-2)+2\tan(2\pi-2)}=\frac{\cot 2+\cot 2}{\tan 2-2\tan 2}=\frac{2\cot 2}{-\tan 2}=\frac{-2}{\tan^2 2}$$ (۴)

$$1-\cos 2=2+2\cos 2\rightarrow \cos 2=-\frac{1}{3}\rightarrow \sin 2=\sqrt{1-\cos 2}^{(2\text{nd})}=\sqrt{\frac{8}{9}}=\frac{2\sqrt{2}}{3}$$

$$\tan 2=\frac{\sin 2}{\cos 2}=\frac{\frac{2\sqrt{2}}{3}}{-\frac{1}{3}}=-2\sqrt{2}\rightarrow \tan^2 2=(-2\sqrt{2})^2=8$$

$$\rightarrow \frac{-2}{\tan^2 2}=\frac{-2}{8}=\boxed{-\frac{1}{4}}\checkmark$$

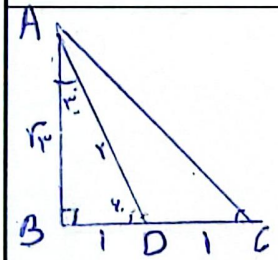
۸

$$l_A=l_B\rightarrow \theta_A r_A=\theta_B r_B\rightarrow \frac{2}{5}\pi(r_A)=(\frac{9\pi}{10})r_B$$

$$\frac{10\Delta}{24^\circ}\times 2\pi=\frac{2}{5}\pi\qquad\rightarrow \frac{r_A}{r_B}=\frac{\frac{9\pi}{10}}{\frac{2\pi}{5}}=\frac{3}{2}$$ (۴)

$$\frac{S_A}{S_B}=\frac{r_A^2\pi}{r_B^2\pi}=(\frac{r_A}{r_B})^2=(\frac{3}{2})^2=\boxed{\frac{9}{4}}\checkmark$$

۹



$$S=\frac{1}{2}AB\times BC=\sqrt{12}\rightarrow AB\times BC=12\sqrt{2}\rightarrow 6\times BC=12\sqrt{2}$$

$$\rightarrow \underline{BC=2}$$

$$\frac{BD}{\sin 30^\circ}=\frac{AD}{\sin 90^\circ}\rightarrow \underline{AD=4}\qquad \frac{AB}{\sin 60^\circ}=\frac{AD}{\sin 90^\circ}\rightarrow \underline{AB=2\sqrt{3}}$$

$$DC=BC-BD=2-1=1\qquad \tan C=\frac{AB}{BC}=\frac{2\sqrt{3}}{2}$$ (۴)

$$\sin 2C=\frac{2\tan C}{1+\tan^2 C}=\frac{2\sqrt{3}}{1+3}=\frac{2\sqrt{3}}{4}=\frac{6\sqrt{3}}{7}\checkmark$$

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$$\sin\theta=\sin(90^\circ-2\alpha)=\cos 2\alpha$$

$$\cos 2\alpha=\cos(\alpha+\alpha)=\cos\alpha\cos\alpha-\sin\alpha\sin\alpha$$

$$=\cos^2\alpha-\sin^2\alpha=(\frac{3}{\sqrt{13}})^2-(\frac{2}{\sqrt{13}})^2\checkmark=\frac{5}{13}$$

$$\rightarrow \boxed{\sin\theta=\frac{5\sqrt{13}}{13}}\qquad \frac{9}{13}-\frac{4}{13}=\frac{5}{13}$$

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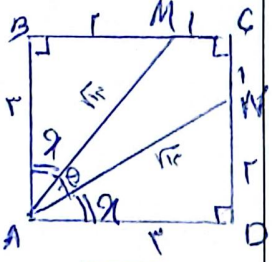

$$AM=AN=\sqrt{2^2+3^2}=\sqrt{13}$$