

۱۸, ۲۵

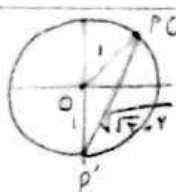
$$\frac{\frac{\sqrt{3}}{4}a - \frac{\sqrt{3}}{4}b}{-\frac{1}{4}a + \frac{1}{4}b} = -\frac{\sqrt{3}}{4} \rightarrow \frac{\frac{\sqrt{3}}{4}a - \frac{\sqrt{3}}{4}b}{\frac{1}{4}b - \frac{1}{4}a} = -\frac{\sqrt{3}}{4} \rightarrow \frac{\sqrt{3}}{4}a - \frac{\sqrt{3}}{4}b = -\frac{\sqrt{3}}{4}b + \frac{\sqrt{3}}{4}a$$

$$\rightarrow \frac{\sqrt{3}}{4}a = \frac{\sqrt{3}}{4}b \rightarrow 2a = b$$

$$\frac{b}{a} = 2$$

$$\frac{\sqrt{3}(a+b)}{(a-b)} = -\frac{\sqrt{3}}{3} \quad \boxed{\frac{b}{a} = -2}$$

$$3a + 3b = b - a \rightarrow b = -4a \quad (1)$$

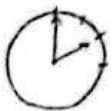


$P = \frac{\pi}{6}^\circ$
 $P' = 270^\circ$

$$PP' = \sqrt{(\frac{1}{4} - \frac{1}{4})^2 + (\frac{\sqrt{3}}{4} + 1)^2} = \sqrt{\frac{1}{16} + \sqrt{3} + \frac{1}{4}} = \sqrt{\sqrt{3} + \frac{5}{4}}$$

محیط $POPP'$: $2 + \sqrt{\sqrt{3} + \frac{5}{4}}$ ✓

(۲)



در یک عقربه ساعت شمار بر حسب درج، نصف حرکت دقیقه شمار بررسی دقیقه است.

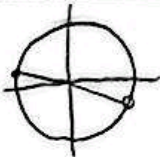
$$\frac{\pi}{9} = \frac{x}{180} \rightarrow x = 20^\circ \rightarrow \text{دقیقه شمار} = 30 \text{ min} \quad \checkmark$$

ساعت $X: 30'$

۱, ۷۵

$$x^\circ = \left| \frac{11}{4}M - 30H \right| \rightarrow 20 = \left| \frac{11}{4}M - 30 \times 3 \right|$$

$$\left| \frac{11}{4}M - 90 \right| = 20 \quad \begin{cases} \frac{11}{4}M - 90 = 20 \rightarrow M = 20' \quad \checkmark \text{ مجاز} \rightarrow 3:20' \\ \frac{11}{4}M - 90 = -20 \rightarrow M = \frac{140}{11}' \quad \text{قبل از ۳} \end{cases} \quad (2)$$



$$-\frac{\pi}{4} < x \leq \frac{\omega\pi}{4}$$

$$-\frac{1}{4} < \sin x \leq 1 \rightarrow -\frac{1}{4} < \frac{m-2}{\omega} \leq 1 \rightarrow -\frac{\omega}{4} < m-2 \leq \omega$$

$$\rightarrow \frac{1}{4} < m \leq 1 \quad \checkmark$$

(۲)

$$\frac{\sin(90^\circ + 12^\circ) + k \cos(180^\circ - 12^\circ)}{\cos(180^\circ - 12^\circ) + Y \sin(180^\circ + 12^\circ)} = \frac{\cos 12^\circ - k \sin 12^\circ}{-\cos 12^\circ - Y \sin 12^\circ}$$

$$\xrightarrow{\div \cos 12^\circ} \frac{1 - k \tan 12^\circ}{-1 - Y \tan 12^\circ} = \frac{1 - \frac{k}{Y}}{-1 - Y(\frac{1}{Y})} = \frac{1 - \frac{k}{Y}}{-\frac{Y}{Y}} = Y \rightarrow 1 - \frac{k}{Y} = -\frac{Y}{Y} \rightarrow \frac{11}{Y} = \frac{k}{Y}$$

$$\rightarrow k = 11 \checkmark$$

6

$$\frac{1 - \cos x}{1 + \cos x} = Y \rightarrow 1 - \cos x = Y + Y \cos x \rightarrow -\frac{1}{Y} = \cos x$$

$$\cot x = -\frac{1}{Y\sqrt{Y}} \checkmark$$

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$$\sin^2 x + \cos^2 x = 1 \rightarrow \sin^2 x + \frac{1}{Y} = 1 \rightarrow \sin x = \frac{Y\sqrt{Y}}{Y}$$

$$\frac{\tan(\frac{\pi}{Y} - x) - \cot(\pi - x)}{\cot(\frac{\pi}{Y} - x) + Y \tan(\pi - x)} = \frac{\cot x + \cot x}{\tan x - Y \tan x} = \frac{Y \cot x}{-\tan x} = -Y \frac{\frac{1}{Y\sqrt{Y}}}{-\frac{1}{Y}} = -Y \times (-\frac{1}{Y}) = \frac{1}{Y}$$

$$\rightarrow -Y \cot x = -Y(\frac{1}{Y}) = -\frac{1}{Y}$$

$$\frac{10\Lambda}{1\Lambda} = \frac{x}{r} \rightarrow x = \frac{Y}{\Delta} r$$

$$aR = L$$

$$L_A = \frac{Y}{\Delta} r \times R_A$$

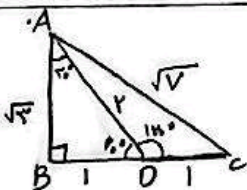
$$L_B = \frac{9r}{10} \times R_B$$

$$\frac{Y}{\Delta} r \times R_A = \frac{9}{10} r \times R_B \rightarrow R_A = \frac{Y}{Y} R_B$$

$$\frac{A_A}{A_B} = \left(\frac{R_A}{R_B}\right)^2 = \left(\frac{Y}{Y}\right)^2 = \frac{Y}{9} \checkmark$$

Y

1



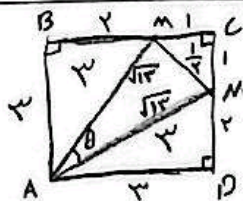
$$S_{ABD} = \frac{\sqrt{Y}}{Y} \rightarrow S_{ADC} = \frac{\sqrt{Y}}{Y} \rightarrow AD \rightarrow \perp$$

$$AC^2 = AB^2 + BC^2 \rightarrow AC^2 = Y + Y = 2Y \rightarrow AC = \sqrt{2Y}$$

$$\sin \gamma C = Y \sin C \cos C = Y \times \frac{\sqrt{Y}}{\sqrt{2Y}} \times \frac{Y}{\sqrt{2Y}} = \frac{Y\sqrt{Y}}{2Y} \checkmark$$

Y

9



$$S_{ABCD} = Y$$

$$S_{ABM} = Y$$

$$S_{ADN} = Y$$

$$S_{MCN} = \frac{1}{Y}$$

$$S_{MAN} = \frac{\Delta}{Y} = \frac{1}{Y} \times \sqrt{Y} \times \sqrt{Y} \times \sin \theta \rightarrow \sin \theta = \frac{\Delta}{Y} \checkmark$$

Y

1.