

$$\frac{a \sin \frac{6\pi}{9} + b \cos \frac{7\pi}{9}}{a \sin \frac{11\pi}{9} + b \cos \frac{\pi}{9}} = \tan \frac{2\pi}{9}$$

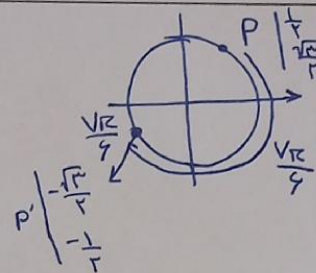
$$\frac{(\frac{\sqrt{3}}{2})a + (-\frac{1}{2})b}{(-\frac{1}{2})a + (\frac{1}{2})b} = \frac{-\sqrt{3}}{3} \rightarrow \frac{\sqrt{3}a - b}{b - a} = \frac{-\sqrt{3}}{3} \rightarrow (-\sqrt{3} + 3)b = 2\sqrt{3}a \rightarrow \frac{b}{a} = \frac{2\sqrt{3}}{3 - \sqrt{3}}$$

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$P(\frac{1}{2}, y) \xrightarrow{\text{در مختصات جیب}} P'$ opp' چیست؟

$$b_{PP'} = R + R + PP'$$

$$1 + 1 + \sqrt{\left(\frac{1+\sqrt{3}}{2}\right)^2 + \left(\frac{1-\sqrt{3}}{2}\right)^2} = 2 + \sqrt{2} \left(\frac{1+\sqrt{3}}{2}\right)$$



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در هر دقیقه عقربه ساعت = ۶° و دقیقه = ۰.۵° و هر دقیقه عقربه = ۱۲ برابر ساعت = ۱۲°

$$\frac{12\pi}{9} = 240^\circ \xrightarrow{\times 12} \frac{12\pi}{9} = 240^\circ \quad \frac{240^\circ}{6^\circ} = 40 \text{ دقیقه}$$

ساعت ۲:۴۰'

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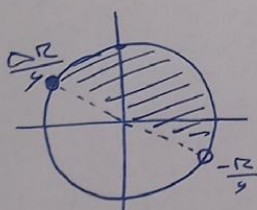
$$\alpha = |\omega/\omega m - \omega_0 h| \rightarrow \omega/\omega m_1 - \omega_0 \times 3 = 20 \rightarrow \frac{110}{\omega/\omega} = m_1 \rightarrow 20$$

$$\omega/\omega m_2 - \omega_0 \times 3 = -20$$

۲۰ دقیقه

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$$-\frac{\pi}{9} < \alpha \leq \frac{2\pi}{9} \rightarrow -\frac{1}{2} < \sin \alpha \leq 1 \rightarrow -\frac{1}{2} < \frac{m-3}{2} \leq 1$$



$$\times 2 \rightarrow -2 < m-3 \leq 2 \xrightarrow{+3} 1 < m \leq 5$$

۸ عدد صحیح

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$$\frac{\sin(10^\circ) + K \cos(120^\circ)}{\cos(140^\circ) + 2 \sin(140^\circ)} = 2$$

$$\frac{\cos(120^\circ) + K(-\sin(120^\circ))}{-\cos(120^\circ) - 2 \sin(120^\circ)} = 2 \xrightarrow{\div \cos(120^\circ)} \frac{1 - K \tan(120^\circ)}{-1 - 2 \tan(120^\circ)} = \frac{1 - 0.1732K}{-1.1732} = 2$$

$$\rightarrow K = 2.2$$

$$\frac{1 - \cos n}{1 + \cos n} = r \quad \frac{\tan(\frac{r}{r} - n) - \cot(r - n)}{\cot(\frac{r}{r} - n) + r \tan(r - n)}$$

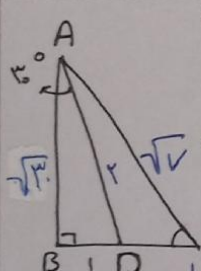
$$\frac{\cot n + \cot n}{\tan n - r \tan n} = \frac{r \cot n}{-\tan n} = -r \times \frac{\frac{\cos n}{\sin n}}{\frac{\sin n}{\cos n}} = -r \times \frac{\cos n}{\sin^2 n} = -r \times \frac{1}{\frac{n}{x}} = \frac{-1}{x}$$

$$\rightarrow 1 - \cos n = r + r \cos n \rightarrow r \cos n = -1 \rightarrow \cos n = -\frac{1}{r} \quad \sin n = \sqrt{1 - \frac{1}{r^2}} = \frac{\sqrt{r^2 - 1}}{r}$$

$$\frac{r}{10} \times \frac{10 \times}{x \times 10} = \frac{l}{r \times R_A} \quad \frac{9}{10} \times \frac{9 \times}{r \times 10} = \frac{l}{r \times R_B} \quad * \quad \frac{4 \pi R_A}{1} = \frac{4 \pi R_B}{r \times 10} \rightarrow \frac{R_A}{R_B} = \frac{r}{10}$$

$$l = \frac{4 \pi R_A}{10} \quad l = \frac{1 \pi R_B}{10}$$

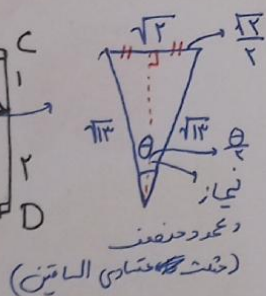
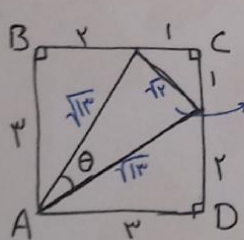
$$\frac{S_A}{S_B} = \left(\frac{R_A}{R_B}\right)^2 \rightarrow \left(\frac{r}{10}\right)^2 = \frac{9}{x}$$



$S_{ABC} = \sqrt{3}$ $\sin \hat{C} = \frac{\sqrt{3}}{2}$ $\cos \hat{C} = \frac{1}{2}$ $\sin 60^\circ = \frac{1}{2}$

$$S = \frac{1}{2} \times BC \times AD = \sqrt{3} \rightarrow BC = 2$$

$$\Delta ABC \Rightarrow (\sqrt{3})^2 + (2)^2 = 7 \quad AC = \sqrt{7}$$



$$\sin \frac{\theta}{2} = \frac{\frac{\sqrt{3}}{2}}{1} = \frac{\sqrt{3}}{2}$$

$$\cos \frac{\theta}{2} \rightarrow 1 = \sin^2 \frac{\theta}{2} + \cos^2 \frac{\theta}{2}$$

$$1 = \frac{3}{4} + \cos^2 \frac{\theta}{2} \rightarrow \cos \frac{\theta}{2} = \frac{\sqrt{1}}{2}$$

$$\sin \theta = 2 \sin \frac{\theta}{2} \cos \frac{\theta}{2} = 2 \times \frac{\sqrt{3}}{2} \times \frac{1}{2} = \frac{\sqrt{3}}{2}$$

$$= \frac{\sqrt{3}}{2}$$