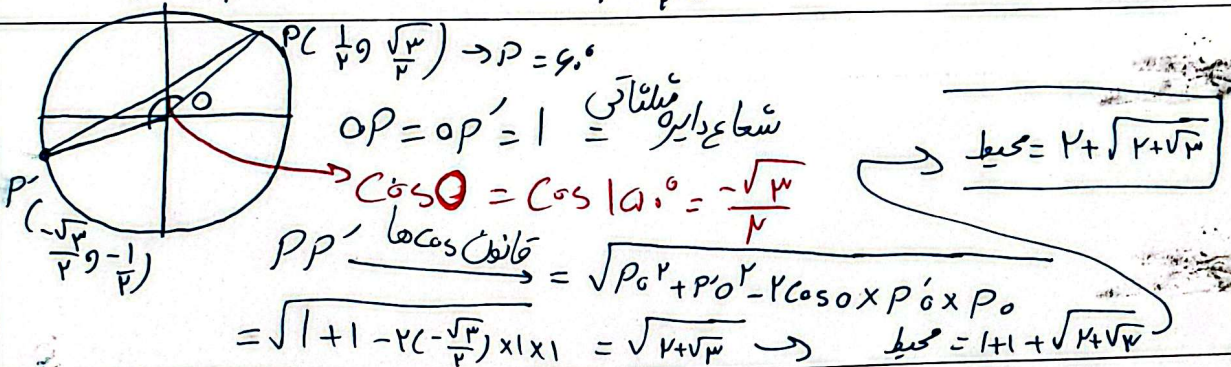


$$\tan \frac{\omega\pi}{6} = -\frac{\sqrt{3}}{3} \Rightarrow \frac{a \sin(\frac{\omega\pi}{6}) + b \cos(\frac{\omega\pi}{6})}{a \sin(\frac{11\pi}{6}) + b \cos(\frac{11\pi}{6})} = -\frac{\sqrt{3}}{3}$$

$a(-\frac{\sqrt{3}}{3}) \quad -\frac{1}{3}a \quad +\frac{1}{3}b$

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

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



$$\frac{D}{180} = \frac{R_{\text{rad}}}{\pi} \Rightarrow \frac{D}{180} = \frac{R}{\frac{\pi}{9}} = \frac{1}{9} = D^\circ = 2^\circ$$

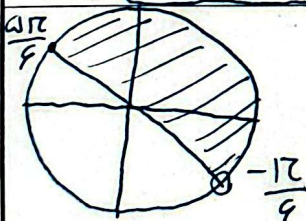
عقربه ساعت شما، 2° جلو زده پس عقربه دقیقه شما، 2° عقب زده است.

$\Rightarrow$ ساعت: $2:48'$

$$\alpha = \left| \frac{11M}{2} - 90 \right| \xrightarrow{\text{ساعت ۳ است}} 2.1 = \frac{11M}{2} - 90$$

$$\Rightarrow 2.1 = \frac{11M}{2} - 90 \Rightarrow \frac{11M}{2} = 92.1 \Rightarrow M = 2$$

چون دقیقه ۲ است پس عقربه دقیقه شما، از ساعت شما، جلو زده پس برای دو مین بار است که زاویه بین آنها 2° است = جواب: بعد از ۲ دقیقه



$$-\frac{12}{6} < \theta \leq \frac{\omega\pi}{6} \Rightarrow -\frac{1}{3} < \sin \theta \leq 1$$

$$\Rightarrow -\frac{1}{3} < \frac{m-3}{\omega} \leq 1 \Rightarrow -\frac{\omega}{3} < m-3 \leq \omega$$

$$\Rightarrow \boxed{\frac{1}{3} < m \leq 1}$$

$$\frac{\sin(\frac{\pi}{2} + 120^\circ) + k \cos(\frac{\pi}{2} - 120^\circ)}{\cos(\pi - 120^\circ) + \mu \sin(\pi + 120^\circ)} = \mu \Rightarrow \frac{\cos(120^\circ) - k \sin(120^\circ)}{-\cos(120^\circ) - \mu \sin(120^\circ)} = \mu$$

$$\div \cos(120^\circ) \Rightarrow \frac{1 - k \tan(120^\circ)}{-1 - \mu \tan(120^\circ)} = \mu \Rightarrow \frac{1 - 0/\mu k}{-1 - 0/\mu} = \mu \Rightarrow \frac{1}{-1} = \mu \Rightarrow \mu = -1$$

$$\frac{1 - \cos x}{1 + \cos x} = \mu \Rightarrow 1 - \cos x = \mu + \mu \cos x \Rightarrow \cos x = -\frac{1}{\mu} \Rightarrow \sin x = \frac{\sqrt{1 - \frac{1}{\mu^2}}}{\mu}$$

$$\frac{\tan(\frac{\pi}{2} - x) - \cot(\pi - x)}{\cot(\frac{\pi}{2} - x) + \mu \tan(\pi - x)} \rightarrow \frac{\cot(x) + \cot(x)}{\tan(x) - \mu \tan(x)} = \frac{2\cot(x)}{\tan(x)(1 - \mu)} = \frac{2}{\tan(x)(1 - \mu)}$$

$$\cot x = \frac{\sqrt{1 - \frac{1}{\mu^2}}}{\frac{1}{\mu}} = \mu \sqrt{1 - \frac{1}{\mu^2}} = \sqrt{\mu^2 - 1}$$

$$\frac{1 \cdot 1}{1 \cdot 1} = \frac{\text{Rad}}{\pi} \Rightarrow \text{Rad} = \frac{4}{1} \pi \Rightarrow L_A = r_A \times \frac{4}{1} \pi$$

$$9 L_B = r_B \times \frac{9}{1} \pi \Rightarrow r_B \times \frac{9}{1} \pi = r_A \times \frac{4}{1} \pi$$

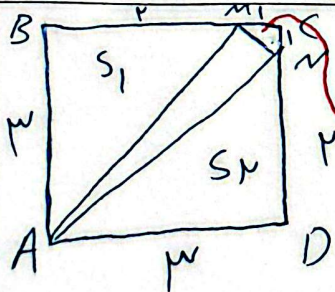
$$\frac{r_A}{r_B} = \frac{\frac{4}{1}}{\frac{9}{1}} = \frac{4}{9} = \frac{\mu}{\nu} \Rightarrow \frac{A_A}{A_B} = \frac{\pi r_A^2}{\pi r_B^2} = \left(\frac{r_A}{r_B}\right)^2 = \left(\frac{4}{9}\right)^2 = \frac{16}{81}$$

$$\sin 30^\circ = \frac{BD}{AD} = \frac{1}{2} \Rightarrow AD = 2 \cdot BD = 2 \cdot 1 = 2$$

$$S_{ABC} = \sqrt{3} = \frac{\sqrt{3}}{2} \times (1 + DC) \Rightarrow \sqrt{3} = \frac{\sqrt{3}}{2} \times (1 + DC) \Rightarrow 2 = 1 + DC \Rightarrow DC = 1$$

$$\sin C = \frac{AB}{AC} \Rightarrow \sin C = \frac{1}{\sqrt{2}} \Rightarrow \cos C = \frac{1}{\sqrt{2}} \Rightarrow AC = \sqrt{2}$$

$$\sin \pi C = \mu \sin C \cos C = \mu \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = \frac{\mu}{2}$$



$$AM^2 = 1^2 + 1^2 = 2 \Rightarrow AM = \sqrt{2} = AN$$

$$S_{AMN} = S_1 - (S_2 + S_3 + S_4) = 1 - \left(\frac{1}{2} + \frac{1}{2} + \frac{1}{2}\right) = \frac{1}{2}$$

$$S_{AMN} = \frac{1}{2} \sin \theta \times AM \times AN = \frac{1}{2} \sin \theta \times \sqrt{2} \times \sqrt{2} = \sin \theta$$

$$\Rightarrow \frac{1}{2} = \sin \theta \Rightarrow \theta = \frac{\pi}{6} = \frac{30^\circ}{1}$$