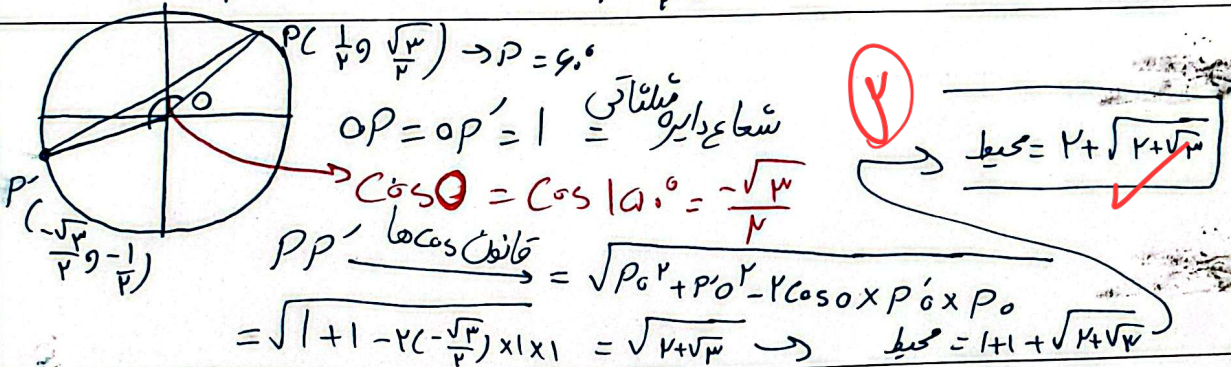


$$\tan \frac{\omega\pi}{6} = -\frac{\sqrt{3}}{3} \Rightarrow \frac{a \sin(\frac{\omega\pi}{6}) + b \cos(\frac{\omega\pi}{6})}{a \sin(\frac{11\pi}{6}) + b \cos(\frac{11\pi}{6})} = -\frac{\sqrt{3}}{3}$$

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

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



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

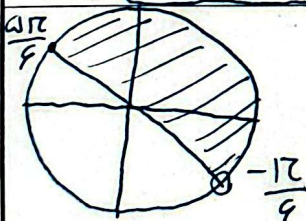
عقربه ساعت شمار 2° جلو زفته پس عقربه دقیقه شمار 2° عقبه جلو زفته

$\Rightarrow$ ساعت: $2:41$ ✓

$$\alpha = \left| \frac{11M}{3} - 90 \right| \xrightarrow{\text{ساعت 3 است}} 2.1 = \frac{11M}{3} - 90$$

$$\Rightarrow 2.1 = \frac{11M}{3} - 90 \Rightarrow \frac{11M}{3} = 92.1 \Rightarrow M = 2.1$$

چون دقیقه ۲ است پس عقربه دقیقه شمار از ساعت شمار جلو زده پس برای دومین بار است که زاویه بین آنها 2° است = جواب: بعد از ۲ دقیقه ✓



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

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

$$\Rightarrow \frac{1}{3} < m \leq 1 \quad \checkmark$$

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

$$\div \cos(120^\circ) \rightarrow \frac{1 - k \tan(120^\circ)}{-1 - y \tan(120^\circ)} \frac{\tan(120^\circ)}{\tan(120^\circ)} = \frac{1 - 0.173k}{-1 - 0.173y} = y \Rightarrow \frac{1}{y} k = \frac{1}{0.173} \Rightarrow k = y \cdot 0.173$$

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

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

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

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

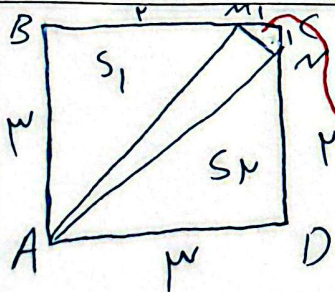
$$\frac{r_A}{r_B} = \frac{\frac{4}{1}}{\frac{9}{1}} = \frac{4}{9} = \frac{r}{r} \Rightarrow \frac{A_A}{A_B} = \frac{\pi r_A^2}{\pi r_B^2} = \left(\frac{r_A}{r_B}\right)^2 = \left(\frac{4}{9}\right)^2 = \frac{16}{81}$$

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

$$S_{ABC} = \sqrt{3} = \frac{\sqrt{3}}{4} \times (1 + DC) \Rightarrow \sqrt{3} = \frac{\sqrt{3}}{4} \times (1 + DC) \Rightarrow 4 = 1 + DC \Rightarrow DC = 3$$

$$\Rightarrow DC = 3 \Rightarrow \sin C = \frac{AB}{AC} = \frac{1}{2} \Rightarrow AC = 2 \Rightarrow \cos C = \frac{AD}{AC} = \frac{2}{2} = 1$$

$$\sin 120^\circ = y \sin C \cos C = y \times \frac{\sqrt{3}}{2} \times 1 \Rightarrow \sin 120^\circ = \frac{y \sqrt{3}}{2} \Rightarrow y = \frac{2 \sin 120^\circ}{\sqrt{3}} = \frac{2 \times \frac{\sqrt{3}}{2}}{\sqrt{3}} = 1$$



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

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

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

$$\Rightarrow \frac{1}{2} = \frac{1}{2} \sin \theta \times 1 \times 1 \Rightarrow \theta = \frac{\pi}{2} = \frac{90^\circ}{1} = 90^\circ$$