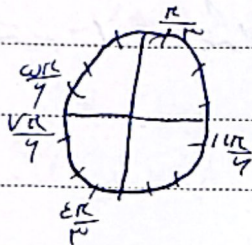


۲) تبدیل

لیف

$$\frac{a \sin \frac{\epsilon \sqrt{\mu}}{\gamma} + b \cos \frac{\sqrt{\mu}}{\gamma}}{a \sin \frac{1/\sqrt{\mu}}{\gamma} + b \cos \frac{\sqrt{\mu}}{\gamma}} = \tan \frac{\phi R}{\gamma} \rightarrow \frac{-\frac{\sqrt{\mu}}{\gamma} a - \frac{\sqrt{\mu}}{\gamma} b}{-\frac{1}{\gamma} a + \frac{1}{\gamma} b} = -\frac{\sqrt{\mu}}{\mu} \quad -1$$



$$\frac{\sqrt{\mu}}{\gamma} a - \frac{\sqrt{\mu}}{\gamma} b = -\frac{\sqrt{\mu}}{\gamma} a - \frac{\sqrt{\mu}}{\gamma} b$$

$$\frac{\sqrt{\mu}}{\gamma} a + \frac{\sqrt{\mu}}{\gamma} a = \frac{\sqrt{\mu}}{\gamma} b - \frac{\sqrt{\mu}}{\gamma} b \rightarrow \frac{\epsilon \sqrt{\mu}}{\gamma} a = -\frac{\sqrt{\mu}}{\gamma} b$$

$$\frac{b}{a} = \frac{\frac{\epsilon \sqrt{\mu}}{\gamma}}{-\frac{\sqrt{\mu}}{\gamma}} = -\epsilon \quad \text{---} \rightarrow b$$

$P(\frac{1}{\gamma}, \frac{\sqrt{\mu}}{\gamma})$ $\sin P = \frac{\sqrt{\mu}}{\gamma} \rightarrow P = 45^\circ$ $\cos P = \frac{1}{\gamma} \rightarrow P(\frac{1}{\gamma}, \frac{\sqrt{\mu}}{\gamma}) = \gamma$

$P'(\frac{\sqrt{\mu}}{\gamma}, \frac{1}{\gamma})$ $P(\frac{1}{\gamma}, \frac{\sqrt{\mu}}{\gamma})$

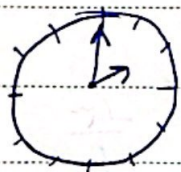
$$PP' = \sqrt{\left(\frac{-\sqrt{\mu}-1}{\gamma}\right)^2 + \left(\frac{1-\sqrt{\mu}}{\gamma}\right)^2} = \sqrt{\frac{\epsilon + 2\sqrt{\mu}}{\epsilon} + \frac{\epsilon - 2\sqrt{\mu}}{\epsilon}}$$

$$= \sqrt{\frac{4}{\epsilon}} = \frac{2}{\sqrt{\epsilon}} \rightarrow P_{opp} = |1| + \sqrt{2} = 1 + \sqrt{2}$$

---} b

$$\frac{D}{R_0} = \frac{R_{ad}}{R} \rightarrow \frac{\frac{\pi}{9}}{\pi} \times 110 = 20^\circ = D$$

۳-



در ساعت ۱۱ در ۳۰° علی می کند و در دقیقه ۴ در ۶۰°

$$\frac{360}{12} = 30 \rightarrow$$

که عقربه ساعت را علی می نکرده است

عقربه ساعت شمار به اندازه ی نصف عقربه ی چهارم می رود $3(4) + 20 = 20$

$$2:40$$

صواب

$$\left(30H - \frac{11}{2}M \right) = 20 \rightarrow 90 - \omega \omega M = 20 \rightarrow M = 70 \times \frac{1}{\omega} = 12.4$$

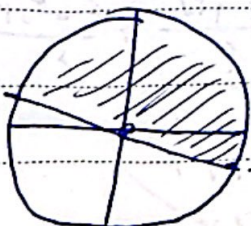
$$90 - \omega \omega M = -20 \rightarrow M = 110 \times \frac{1}{\omega} = 20$$

سینوس از گزشت با دقیقه در ساعت ۲ و ۳ دقیقه از ساعت ۲۰ عقربه ها ۲۰ در ۲۰
دقیقه ۱۰

$$-\frac{\pi}{4} \leq m \leq \frac{\omega \pi}{4} \rightarrow -\frac{1}{4} \leq \sin m \leq 1$$

۱-

$$\omega_0 = \frac{\omega \pi}{4}$$



$$\frac{\pi}{4} = 45^\circ$$

$$-\frac{1}{4} \leq \frac{m - \pi}{\omega} \leq 1 \rightarrow -\frac{\omega}{4} \leq m - \pi \leq \omega \rightarrow$$

$$\rightarrow \boxed{-\frac{1}{4} \leq m \leq 1}$$

صواب

$$\frac{\sin(14\omega^\circ) + k \cos(14\omega^\circ)}{\cos(14\omega^\circ) + P \sin(14\omega^\circ)} = \frac{\sin(\frac{\pi}{4} + 1\omega) + k \cos(\frac{\pi}{4} - 1\omega)}{\cos(\frac{\pi}{4} - 1\omega) + P \sin(\frac{\pi}{4} + 1\omega)} = \mu \rightarrow -4$$

$$\tan 1\omega^\circ = 0.176$$

$$\rightarrow \frac{\cos 1\omega - k \sin 1\omega}{-\cos 1\omega - P \sin 1\omega} = \mu \quad \div \cos 1\omega \quad \frac{1 - k \tan 1\omega}{-1 - P \tan 1\omega} = \mu$$

$$\rightarrow 1 - 0.176k = -1 - 0.176 \rightarrow 0.176k = 0.176 \rightarrow k = 1$$

$$\frac{1 - \cos m}{1 + \cos m} = r, 1 - \cos m = r, r \cos m \rightarrow r \cos m = -1 - \cos m = -\frac{1}{r} - V$$

$$r \cos m \rightarrow \sin m (+), \cos m (-) \quad \frac{\tan(\frac{\pi}{r} - m) - \cot(\pi - m)}{\cot(\frac{\pi r}{r} - m) + r \tan(\pi - m)}$$

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

$$\cos m = \frac{1}{r}, \sin^2 m + \cos^2 m = 1 \rightarrow \sin^2 m = 1 - \frac{1}{r^2} = \frac{r^2 - 1}{r^2}$$

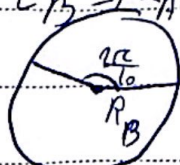
$$\frac{-r \cos m}{\sin^2 m} = \frac{-r(\frac{1}{r})}{\frac{r^2 - 1}{r^2}} = \frac{-\frac{r}{r}}{\frac{r^2 - 1}{r^2}} = \frac{-1}{\frac{r^2 - 1}{r^2}} = \frac{-1}{\frac{r^2 - 1}{r^2}}$$

$$\frac{D}{110} = \frac{Rad}{r} \rightarrow \frac{1011}{110} = \frac{Rad}{r}, Rad = \frac{110}{\omega} \quad \frac{S_A}{S_B} = ? \quad -1$$

$$L = \alpha R \rightarrow L_A = L_B = \alpha_A R_A = \alpha_B R_B, \frac{110}{\omega} R_A = \frac{110}{\omega} R_B \rightarrow \frac{R_A}{R_B} = \frac{110}{110} = 1$$

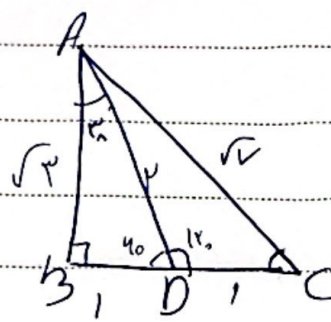


A



B

$$\frac{S_A}{S_B} = \left(\frac{R_A}{R_B}\right)^2 = \left(\frac{110}{110}\right)^2 = 1$$



$$\sin \phi = \frac{BD}{AD} = \frac{1}{y} \rightarrow AD = y$$

9

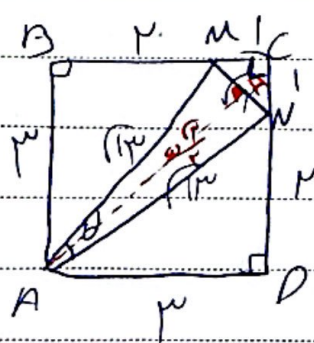
$$\sin \phi = \frac{AB}{AD} = \frac{\sqrt{r}}{y} \rightarrow AB = \sqrt{r}$$

$$S_{\triangle ABC} = \frac{BC \times AD}{2} = \frac{1 \times y}{2} = \frac{y}{2} \Rightarrow \frac{y}{2} = \frac{1}{2} \Rightarrow y = 1, BC = 1$$

$$\therefore DC = 1$$

$$AC = \sqrt{AB^2 + BC^2} = \sqrt{r + 1} = \sqrt{v} \rightarrow \sin C = \frac{AB}{AC} = \frac{\sqrt{r}}{\sqrt{v}}, \cos C = \frac{BC}{AC} = \frac{1}{\sqrt{v}}$$

$$\frac{E \sqrt{r}}{v}$$



$$MN = \sqrt{CN^2 + MC^2} = \sqrt{r^2 + v^2} = \sqrt{r}$$

10

$$AN = \sqrt{AD^2 + ND^2} = \sqrt{r^2 + v^2} = \sqrt{r} \rightarrow \text{Area of } \triangle AMN$$

$$AM = \sqrt{MB^2 + AB^2} = \sqrt{r^2 + v^2} = \sqrt{r}$$

$$MH = NH = \frac{\sqrt{r}}{2}$$

$$AH \rightarrow AH^2 + MH^2 = r^2 \rightarrow AH = \sqrt{r^2 - \left(\frac{\sqrt{r}}{2}\right)^2} = \frac{\omega}{\sqrt{r}} = \frac{\omega \sqrt{r}}{r}$$

$$S_{\triangle AMN} = \frac{MN \times AH}{2} = \frac{\sqrt{r} \times \frac{\omega \sqrt{r}}{r}}{2} = \frac{\omega}{2}$$

$$\frac{1}{2} \times \frac{\sqrt{r}}{r} \times \frac{\sqrt{r}}{r} \times \sin \theta = \frac{\omega}{2} \Rightarrow \frac{1}{r} \sin \theta = \frac{\omega}{r} \rightarrow \sin \theta = \frac{\omega}{r}$$