

(۱۵)
$$a = \frac{-\sqrt{3}}{2} + \frac{-b\sqrt{3}}{2} = \frac{\sqrt{3}}{2} (-a - b) = \frac{-a-b}{-a+b} = \frac{-\sqrt{3}}{2} \Rightarrow$$

$$-3a - 3b = \sqrt{3}a - \sqrt{3}b \Rightarrow -2a - \sqrt{3}a = -\sqrt{3}b + 3b \Rightarrow a(-2-\sqrt{3}) = b(-\sqrt{3}+3) \Rightarrow$$

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

$$P \rightarrow (0, p) = \frac{1}{2} \quad \text{و} \quad \sin P = \frac{1}{2} = \frac{\sqrt{3}}{2} \quad \left\{ \begin{array}{l} P = 60^\circ = \frac{\pi}{3} \\ P = 120^\circ = \frac{2\pi}{3} \end{array} \right.$$

$$P \rightarrow (-1, -1) \quad \text{و} \quad P' \rightarrow \left(\frac{\sqrt{3}}{2}, -\frac{1}{2} \right)$$

$$PP' = \sqrt{\left(\frac{\sqrt{3}}{2} - (-1) \right)^2 + \left(-\frac{1}{2} - (-1) \right)^2} = \sqrt{2+\sqrt{3}} \quad \text{مسافت} = 1+1+\sqrt{2+\sqrt{3}} = 2+\sqrt{2+\sqrt{3}}$$

$$\omega = \frac{2\pi}{T} = \frac{2\pi}{12} = \frac{\pi}{6} \quad \text{و} \quad \frac{\pi}{6} \times 60 = \pi \Rightarrow \frac{\pi}{6} \times 90 = \frac{\pi}{2} \Rightarrow \frac{\pi}{2} \times 60 = 30 \text{ min}$$

$$\frac{2 \times 30}{5} = \frac{120}{5} = 24$$

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$$-\frac{\pi}{2} < x < \frac{\pi}{2} \Rightarrow -\frac{1}{2} < \sin x < \frac{1}{2} \Rightarrow \frac{1}{2} = \frac{m-\pi}{\omega} \Rightarrow m = \frac{1}{2}\omega$$

$$\frac{1}{2} < m < 1 \quad \text{و} \quad \frac{1}{2} < m < 1$$

$$\frac{\sin 10^\circ + k \cos(190^\circ)}{\cos 190^\circ + r \sin 190^\circ} = \frac{+\cos 10^\circ + (-k \sin 10^\circ)}{-\cos 10^\circ + (-r \sin 10^\circ)} \Rightarrow \tan 10^\circ = \frac{r}{k} = \frac{1}{r} \rightarrow \sin'$$

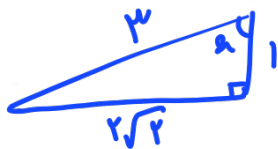
$$\frac{-r-k}{-r-r} = r \Rightarrow -1 = -r-k = 1 \quad k=1r$$

$$\frac{1-k \tan 10^\circ}{-1-r \tan 10^\circ} = r \rightarrow 1 - \frac{k}{r} = -r - \frac{r}{r} \rightarrow -\frac{k}{r} = -\frac{r}{r} \rightarrow \boxed{k=r}$$

$$r + r \cos u = 1 - \cos u \Rightarrow \cos u = \frac{1}{r} \Rightarrow \cos^2 u + \sin^2 u = 1 \Rightarrow \frac{1}{r^2} + \left(\frac{1}{r}\right)^2 = 1 \Rightarrow \sin u = \frac{\sqrt{1-r^2}}{r}$$

$$\tan u = -\frac{1}{\sqrt{1-r^2}}$$

$$\cot u = \frac{-1}{\sqrt{1-r^2}}$$



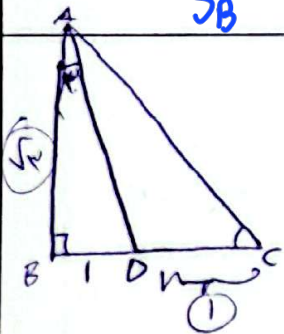
$$\cot u = \frac{-1}{\sqrt{1-r^2}}$$

$$\frac{r \cot u}{-\tan u} = -r \cot' u = \boxed{-\frac{1}{r}}$$

$$L = \frac{r\pi}{\omega} \quad \frac{r\pi}{\omega} \times r_A = \frac{q\pi}{10} \times r_B \Rightarrow \frac{r_A}{r_B} = r \Rightarrow \frac{S_A}{S_B} = \frac{q}{r}$$

$$L_A = L_B \rightarrow \frac{1}{10} \times r_A = \frac{q}{10} \times r_B \rightarrow r_A = \frac{r}{r} r_B$$

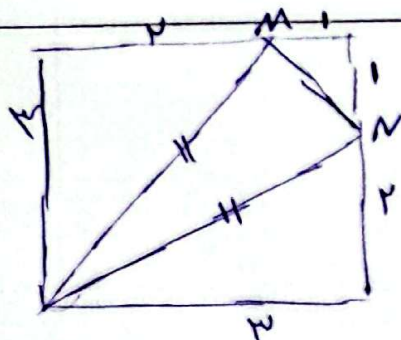
$$\frac{S_A}{S_B} = \left(\frac{r_A}{r_B}\right)^2 = \left(\frac{r}{r}\right)^2 = \boxed{\frac{q}{r}}$$



$$\Rightarrow AB = \sqrt{r} \times 1 = \frac{\sqrt{r}}{r} / \frac{\sqrt{r} \times \sqrt{r}}{r} = \sqrt{r} \times \sqrt{r} = r$$

$$\frac{DC}{AC} = \frac{1}{\sqrt{r}} / \frac{\sin u}{\cos u} = \frac{\frac{\sqrt{r}}{r}}{\frac{1}{\sqrt{r}}} / r \sin u \cos u \Rightarrow$$

$$r \left(\frac{r}{\sqrt{r}} \times \frac{\sqrt{r}}{r} \right) = \frac{r\sqrt{r}}{r} = \frac{\sqrt{r}}{r}$$



$$\cos \theta = r \times r = \frac{q}{r} / S_{\Delta} \Rightarrow \frac{1}{r} + r = \frac{q}{r}$$

$$S_D - S_{\Delta} \Rightarrow A. \gamma. \theta = r / \omega = \frac{1}{r} \times \sin \theta \times (NA)^2$$

$$NA = \sqrt{r^2 + r} = \sqrt{r} \Rightarrow \frac{q}{r} = \sin \theta$$