

شماره ۱۴

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①

$$1 - r \sin^2 m, r \sin m - 1 \Rightarrow r \sin^2 m + r \sin m - 2 = 0 \Rightarrow \text{الف}$$

$$\sin m = \frac{-r \pm \sqrt{r^2 + 4}}{2} \quad \left(\frac{1}{r} \right) = \frac{1}{r} \rightarrow \sin m = \frac{1}{r}$$

$$m = k\pi + \frac{\pi}{4}, \quad m = k\pi + \frac{5\pi}{4}$$

$$r \cos m + \cos m - r = 0 \Rightarrow \cos m = 1 \Rightarrow m = k\pi \quad \text{ب.}$$

$$\cos m = -\frac{r}{r} = -1$$

②

$$\sin^2 m - \cos^2 m = -\cos 2m, \sin 2m \Rightarrow$$

$$-\sin\left(\frac{\pi}{2} - 2m\right), \sin 2m \Rightarrow 2m = k\pi + 2m - \frac{\pi}{2} \Rightarrow m = k\pi - \frac{\pi}{4}$$

$$2m = k\pi + \pi - 2m + \frac{\pi}{2} \Rightarrow m = \frac{k\pi}{4} + \frac{\pi}{8}$$

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$$r + \frac{r \sin m}{\cos m} \cdot \frac{1}{\cos m} \rightarrow 1 + \tan^2 m \rightarrow \text{ب) تقسیم کنیم}$$

$$r + r \tan^2 m < 1 + \tan^2 m \Rightarrow \tan^2 m - r \tan^2 m + 1 < r \Rightarrow (\tan^2 m - 1) < r \Rightarrow \tan m = \sqrt{r+1} \rightarrow m = k\pi + \arctan(\sqrt{r+1})$$

$$\tan m = +\sqrt{r+1} \times$$

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$$\frac{\cos m}{\sin m} (r \cos m + 1) \cdot \frac{1}{\sin m} \rightarrow \frac{1}{\sin m} (r \cos^2 m + \cos m - 1) \cdot \text{الف)}$$

$$\rightarrow \sin m + \dots \rightarrow m + k\pi$$

$$\cos m = -1 \rightarrow m = k\pi + \pi \times \rightarrow \text{مقادیر این Sin که در خارج می آید}$$

مقدارهای این جواب قابل قبول نیست

$$\cos m = \frac{1}{r} \rightarrow m = k\pi + \frac{\pi}{r}$$

$$r - \cos m + \cos^2 m = r(1 + \cos^2 m) \Rightarrow \text{ب) طرفین را بر Sin^2 تقسیم کنیم}$$

$$\cos^2 m + \cos m < r \Rightarrow$$

$$\cos m < -1, \cos m = -1 \rightarrow m = k\pi - \frac{\pi}{2}$$

$$\rightarrow m = k\pi + \frac{\pi}{2}$$

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$$\text{الف) چون تعدادی هم داریم پس از Sin و Cos را در یک طرف می آوریم}$$

$$\sin(m + \frac{\pi}{2}) \cos(m + \frac{\pi}{2}) \cdot \frac{1}{r} \cos(m + \frac{\pi}{2}) \cdot \frac{1}{r} \Rightarrow$$

$$\cos^2 m = \frac{1}{r} \Rightarrow m = k\pi \pm \frac{\pi}{4} \rightarrow m = k\pi \pm \frac{\pi}{4}$$

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$$Q(r_m - \frac{\pi}{q}), -\sin r_m \Rightarrow (\rightarrow$$

$$\sin(\frac{\pi}{r} + \frac{\pi}{q} - r_m), \sin(-r_m) \rightarrow -r_m, r_k \pi - r_m + \frac{11\pi}{1\pi} \times$$

$$\rightarrow -r_m, r_k \pi + \pi + r_m - \frac{11\pi}{1\pi} \Rightarrow -\Sigma m, r_k \pi + \frac{v\pi}{u} \Rightarrow$$

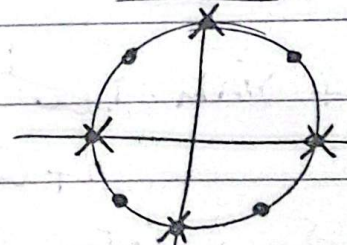
$$k, -\frac{k\pi}{r} - \frac{v\pi}{vr} \Rightarrow m, \frac{k'\pi}{r} - \frac{v\pi}{vr} \quad k' \in \mathbb{Z}$$

$$\frac{\sin \Sigma m + \sin r_m}{\sin r_m} \cdot 1 \Rightarrow \sin \Sigma m + \sin r_m \cdot \sin r_m \Rightarrow \textcircled{0}$$

$$\sin r_m \hookrightarrow \sin r_m \cdot \Rightarrow r_m + k\pi \rightarrow m + \frac{k\pi}{r} \quad \textcircled{1}$$

$$\sin \Sigma m \cdot \rightarrow \Sigma m, k\pi \rightarrow m, \frac{k\pi}{r}$$

$$\textcircled{1} \rightarrow m < \frac{k\pi}{r} + \frac{\pi}{r}$$



$$\phi_{am} \frac{m}{r} \cdot \frac{1 + Q \frac{m}{r}}{\sin \frac{m}{r}} \cdot \frac{1}{\phi_{am} \frac{m}{r}} \Rightarrow \textcircled{4}$$

$$\phi_{am} \frac{r_m}{r} \cdot 1 \Rightarrow \frac{m}{r} \cdot \frac{k\pi + \pi}{r} \Rightarrow m, \Sigma k\pi + \pi$$

$$k = 0 \rightarrow \left. \begin{matrix} u = \pi \\ u = -\pi \end{matrix} \right\} \rightarrow |m_1 - m_2|, |\pi - (-\pi)| < |r\pi|$$

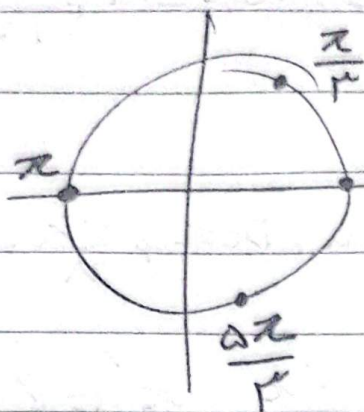
$$Q^r m - \sin^r m Q^r m < 1 \Rightarrow \sin^r m + \sin^r m Q^r m_2 \Rightarrow \textcircled{5}$$

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$$\sin^2 m (1 + \cos 2m) = 0 \Rightarrow \begin{cases} \sin m = 0 \rightarrow m, k\pi \\ \cos 2m = -1 \rightarrow 2m, 2k\pi + \pi \rightarrow \\ m, \frac{2k\pi + \pi}{2} \end{cases}$$



$$\Rightarrow 0, \pi, 2\pi, \frac{\pi}{2}, \frac{5\pi}{2} \rightarrow \text{جواب دارد}$$

$$\cos\left(\frac{\pi}{2} - m\right), \cos 2m \rightarrow 2m, 2k\pi + \frac{\pi}{2} - m \quad (1)$$

$$m, \frac{2k\pi}{2} + \frac{\pi}{2}$$

$$1 + \sin 2m, \cos 2m \Rightarrow 1 + \cos 2m$$

④ توان ۲ درستی

$$\cos 2m, \sin 2m \quad (1) \quad 2m, 2k\pi + \frac{\pi}{2} - 2m \Rightarrow m, \frac{2k\pi}{2} + \frac{\pi}{4} \Rightarrow \sin\left(\frac{\pi}{4} - 2m\right) \quad m, \frac{2k\pi + \pi}{4} \rightarrow m \in \left\{ \frac{\pi}{12}, \frac{5\pi}{12}, \frac{9\pi}{12} \right\}$$

۱. جواب داده شده برش توان ۲ درستی است و فقط $\frac{5\pi}{12}$ جواب داده شده است و فقط $\frac{\pi}{12}, \frac{9\pi}{12}$

$$(2) \quad 2m, 2k\pi + \pi - \frac{\pi}{2} + 2m \Rightarrow -2m, 2k\pi + \frac{\pi}{2} \Rightarrow m, k'\pi - \frac{\pi}{4} \Rightarrow m, \frac{2k'\pi}{2} \rightarrow \text{جواب ندارد}$$

معادله در بسته $[0, \pi]$ شامل ۲ جواب است.

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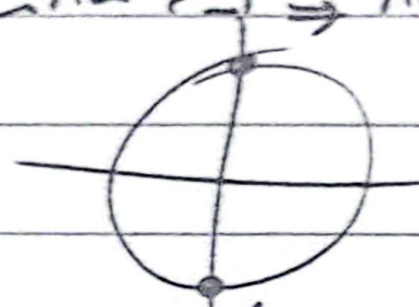
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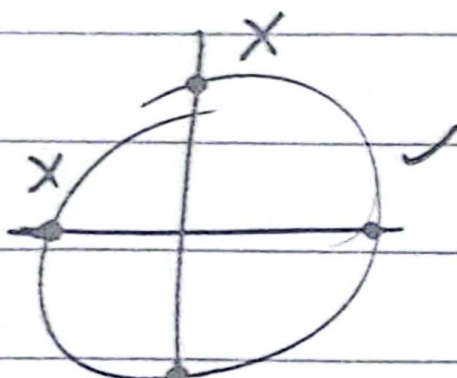
$$\sin^2 m - \cos^2 m = -\cos 2m \Rightarrow \cos 2m = 1 \Rightarrow 2m = 2k\pi + 2\pi$$

$$\rightarrow m = \frac{2k\pi + 2\pi}{2} = k\pi + \pi$$



دو جواب دارد.

$$\sin^3 m - \cos^3 m = 1$$



با ۳ نقطه بر روی دایره امتحان می کنیم.

پس فقط جواب $(\frac{3\pi}{2}, 2\pi, 0)$ را داریم.