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۱۲.۲, ۴, ۷

هانیضیال (دوازدهم دفتر)

تکلیف شماره ۱۷

$$\Lambda \cos u - \frac{\tan^2 u}{-(1 + \tan^2 u)} - 1 = 0 \Rightarrow \Lambda \cos u - \frac{1}{\cos^2 u} = 0 \quad (1)$$

$$\Rightarrow \frac{\Lambda \cos^3 u - 1}{\cos^2 u} = 0 \Rightarrow \Lambda \cos^3 u - 1 = 0 \Rightarrow \Lambda \cos^3 u = 1 \Rightarrow$$

$$\cos^3 u = \frac{1}{\Lambda} \Rightarrow \cos u = \frac{1}{\sqrt[3]{\Lambda}} \Rightarrow [0, 2\pi] \text{ در بازه } \Rightarrow u = \left\{ \frac{\pi}{3}, \frac{2\pi}{3} \right\}$$

$\Rightarrow$ دایه جواب

$$\partial \sin^2 u + r \cos(2u) = -r \Rightarrow 1) \sin^2 u = \frac{1 - \cos 2u}{2}, \quad 2) \cos(2u) = \frac{r \cos^2 u - r \cos u}{r} \quad (2)$$

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

$$\Lambda a^3 - 3a^2 - 4a + 1 = 0 \Rightarrow (a+1)(\Lambda a^2 - 13a + 1) = 0$$

$$(a = -1)$$

$\Delta < 0$
ریشه ندارد

$$\Rightarrow \cos u = -1 \Rightarrow u = \pi + 2k\pi \quad (k \in \mathbb{Z}) \Rightarrow \text{دایه جواب}$$

$$a = 1 \quad [-\pi, \pi] \text{ در بازه}$$

$$r \sin u \cos(2u) + \sin u = 1 \Rightarrow \sin u (r \cos 2u + 1) = 1 \quad (3)$$

$$\Rightarrow \cos 2u = 1 - r \sin^2 u \Rightarrow r \cos 2u + 1 = r(1 - r \sin^2 u) + 1 = 1 - r^2 \sin^2 u$$

$$\cos 2u = 1 - r^2 \sin^2 u$$

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$$\sin u = s \Rightarrow s(r - r_s r) = 1 \Rightarrow r_s^2 r - r_s + 1 = 0 \Rightarrow (s+1)(r_s - 1)r = 0$$

$$\Rightarrow \sin u = -1, \quad \sin u = \frac{1}{r} \Rightarrow u = \frac{\pi}{4}, \frac{5\pi}{4}$$

$$\hookrightarrow u = \frac{3\pi}{4} \quad \textcircled{1}$$

$$\Rightarrow \text{دای ۳ جواب} \Rightarrow \frac{3\pi}{4} + \frac{\pi}{4} + \frac{\delta\pi}{4} = \frac{9\pi + \pi + \delta\pi}{4} = \frac{10\pi + \delta\pi}{4} = \boxed{\frac{\delta\pi}{4}}$$

$[0, 2\pi]$ بازه

$$\sin(u + \frac{\pi}{4}) \cos(u - \frac{\pi}{4}) = 1 \Rightarrow \frac{1}{r} (\sin(u + \frac{\pi}{4} + u - \frac{\pi}{4}) + \sin(u + \frac{\pi}{4} - u + \frac{\pi}{4})) \quad (Y)$$

$$= 1$$

$$\Rightarrow \frac{1}{r} (\sin(2u) + \sin(\frac{\pi}{2})) = 1 \Rightarrow \sin(2u) + 1 = r$$

$$\Rightarrow \sin(2u - \frac{\pi}{4}) = 1 \Rightarrow 2u - \frac{\pi}{4} = \frac{\pi}{2} \Rightarrow 2u = \frac{3\pi}{4} = \frac{\pi}{2} \Rightarrow u = \frac{\pi}{4} \quad \textcircled{2}$$

دای ۱ جواب دیگه $[0, 2\pi]$

$$r \sin u \sin(\frac{3\pi}{4} - u) = 1 \Rightarrow -r \sin u \cos u = 1 \Rightarrow$$

$$-r(\sin 2u) = 1 \Rightarrow \sin 2u = -\frac{1}{r} \Rightarrow 2u = \{\frac{7\pi}{4}, \frac{11\pi}{4}\} \Rightarrow u = \{\frac{7\pi}{8}, \frac{11\pi}{8}\}$$

$$\Rightarrow \frac{7\pi}{8} + \frac{11\pi}{8} \Rightarrow \frac{18\pi}{8} = \boxed{\frac{9\pi}{4}}$$