

(الف) $y^3 = 2n^2 - 1 \rightarrow \left. \begin{array}{l} \text{if } (n_1, y_1) \in f \\ \text{if } (n_2, y_2) \in f \end{array} \right\} \xrightarrow{\text{if } n_1 = n_2} y_1 = y_2$ (1)

$y_1^3 = y_2^3 \rightarrow y_1 = y_2$ ✓ تابع مست

(ب) $y^3 + y = 2n^2 - 1 \rightarrow \left. \begin{array}{l} \text{if } (n_1, y_1) \in f \\ \text{if } (n_2, y_2) \in f \end{array} \right\} \xrightarrow{\text{if } n_1 = n_2} y_1 = y_2$

$y_1^3 + y_1 = y_2^3 + y_2 \rightarrow y_1^3 - y_2^3 + y_1 - y_2 = 0 \rightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1) = 0$

$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1) = 0 \rightarrow y_1 - y_2 = 0 \rightarrow y_1 = y_2$ ✓
 $y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1 = 0$

(1) $\frac{y_1^2}{a} + \frac{y_1 y_2}{b} + \frac{y_2^2}{c} + \frac{y_1}{n} + \frac{y_2}{n} + 1 = 0$ بنزول: $-b \pm \sqrt{b^2 - 4ac}$
 $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$-y_2 \pm \sqrt{y_1^2 - 4y_1 y_2 - 4}$
 $\frac{-y_2 \pm \sqrt{y_1^2 - 4y_1 y_2 - 4}}{2}$

دلتا منفی $n \notin \mathbb{R}$ به طبقه مست اول رابطه تابع است

(الف) $y = n^2 - 1 \rightarrow \left. \begin{array}{l} \text{if } (n_1, y_1) \in f \\ \text{if } (n_2, y_2) \in f \end{array} \right\} \xrightarrow{\text{if } n_1 = n_2} y_1 = y_2 \rightarrow y_1 = y_2$ ✓ تابع مست (2)

(ب) $|y| + ny = n^2 - 1 \xrightarrow{n=0} |y| = 1 \rightarrow y = \pm 1$ لا تابع نیست

(ج) $y^3 + n^3 = 2n - 1 \xrightarrow{n=0} y^3 = -1 \rightarrow y = -1$ ✓ تابع مست

(د) $\sqrt[3]{y} + \sqrt[3]{n} = 2 \xrightarrow{n=0} \sqrt[3]{y} = 2 \rightarrow y = 8$ ✓ تابع مست

$$\frac{\sin}{\cos}$$

الف) $\tan \frac{\pi}{3} \rightarrow \frac{\pi}{3} = 60^\circ \rightarrow \left| \frac{1}{\sqrt{3}} \right| \rightarrow \frac{\sqrt{3}}{1} \times \frac{1}{1} = \sqrt{3}$ (3)

ب) $\cot \frac{\sqrt{3}\pi}{4} \rightarrow \frac{\sqrt{3}\pi}{4} = 75^\circ \rightarrow \left| \frac{-\sqrt{3}}{1} \right| \rightarrow \frac{-\sqrt{3}}{1} \times \frac{1}{1} = -\sqrt{3}$

ج) $\tan 3\pi \rightarrow \frac{11\pi}{4} = \left| \frac{\sqrt{3}}{-1} \right| \rightarrow \frac{-1}{1} \times \frac{1}{\sqrt{3}} = \frac{-1}{\sqrt{3}}$

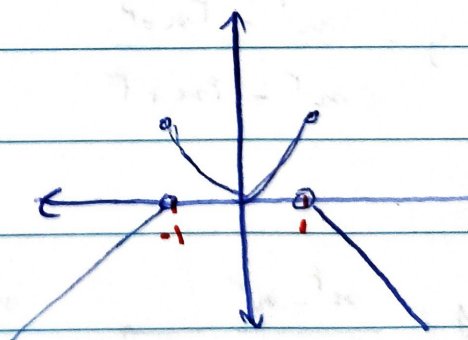
د) $\cot 11\pi \rightarrow \pi = \left| \frac{-1}{0} \right| \rightarrow \frac{-1}{0} \rightarrow$ غلط است زیرا مخرج است

$0 \leq a \leq 2\pi \rightarrow 0 \leq a \leq 360^\circ$

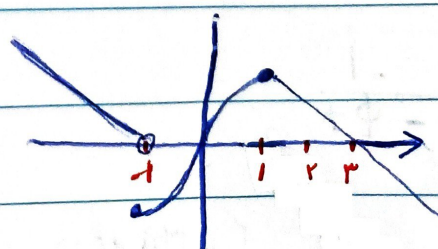
الف) $\sin a = \frac{1}{2} \rightarrow \frac{\pi}{6}, \frac{5\pi}{6}$
 $30^\circ, 150^\circ$

ب) $\cos a = \frac{\sqrt{2}}{2} \rightarrow \frac{\pi}{4}, \frac{7\pi}{4}$
 $45^\circ, 315^\circ$

$$f(n) = \begin{cases} -n+1 & n > 1 \\ n^2 & -1 < n < 1 \\ n+1 & n < -1 \end{cases}$$



$$f(n) = \begin{cases} -n+3 & n > 1 \\ n^2 & -1 \leq n \leq 1 \\ -n-1 & n < -1 \end{cases}$$



الف) $y = (n-2)(n-3)(n-4)$ $\frac{-2 \quad -3 \quad -4}{-\phi + \phi - \phi +}$ (7)

ب) $y = (n-2)(n-3)^2(n-4)$ $\frac{-2 \quad -3 \quad -4}{+\phi - \phi - \phi +}$

الف) $\frac{(n-2)(n-4)}{n-3}$ $\frac{-2 \quad -4}{-\phi + \phi - \phi +}$

ب) $\frac{(n-2)(n-4)}{(n-3)^2}$ $\frac{-2 \quad -4}{+\phi - \phi - \phi +}$

الف) $y = \frac{n^3 - 3n^2}{n-3}$ $\xrightarrow{\text{مجموع فرایب} = 0}$ $\frac{(n-1)^2(n+2)}{n-3}$ (9)
 به $n-1$ بخش پذیره

$\frac{-2 \quad -1 \quad -2}{+\phi - \phi - \phi +}$

ب) $y = \frac{n^3 - 3n^2}{n^3 - 6n + 3}$ $\rightarrow \frac{(n-1)(n-2)}{(n-1)(n-3)}$ $\frac{-1 \quad -2 \quad -3}{+\phi + \phi - \phi +}$

الف) $y = \frac{n^3 - n^2}{n^3 + n^2}$ $\rightarrow \frac{n^2(n^2-1)}{n^2+n^2}$ (10)
 $\Delta = -7 < 0$

$\frac{-1 \quad 0 \quad -1}{+\phi - \phi - \phi +}$

ب) $y = \frac{n^3 + 3n^2}{n^3 + 3n^2}$ $\Delta = -7 < 0$ $\Delta = -1 < 0$ $\mathbb{R}$