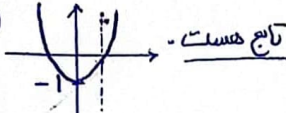


الف)
$$\left. \begin{aligned} y_1^3 &= 2x_1^2 - 1 \\ y_2^3 &= 2x_2^2 - 1 \end{aligned} \right\} \xrightarrow{x_1=x_2} y_1^3 = y_2^3 \quad y_1 = y_2$$
 عبارت تابع هست.

ب)
$$\left. \begin{aligned} y_1^3 + y_1 &= 2x_1^2 - 1 \\ y_2^3 + y_2 &= 2x_2^2 - 1 \end{aligned} \right\} \xrightarrow{x_1=x_2} \begin{aligned} y_1^3 + y_1 &= y_2^3 + y_2 \\ y_1^3 - y_2^3 + y_1 - y_2 &= 0 \end{aligned}$$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + (y_1 - y_2) = 0$

$$\left. \begin{aligned} y_1^3 - y_2^3 + y_1 - y_2 &= 0 \\ y_1 - y_2 &= 0 \end{aligned} \right\} \Leftrightarrow (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 1) = 0$$

$$y_1^2 + y_1 y_2 + y_2^2 + 1 = 0 \quad \Delta < 0 \quad \text{برقرار نیست}$$
 عبارت تابع هست.

الف)  تابع هست. $|y| + 2y = x^2 + 1 \xrightarrow{x=0} |y| = 1 \quad y = 1, y = -1$ تابع نیست.

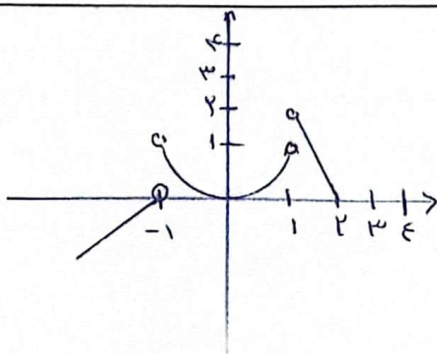
ج)
$$\left. \begin{aligned} y_1^3 &= 2x_1 - 1 - x_1^3 \\ y_2^3 &= 2x_2 - 1 - x_2^3 \end{aligned} \right\} \xrightarrow{x_1=x_2} y_1^3 = y_2^3$$
 $\sqrt[3]{y} = 2 - \sqrt[3]{x}$

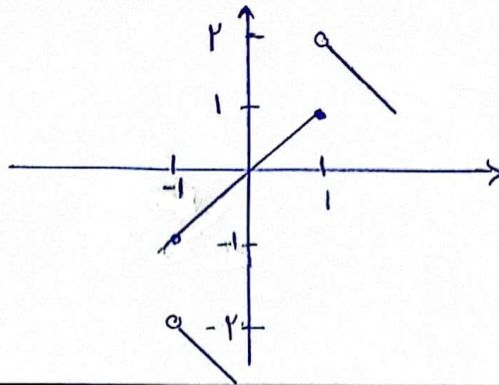
$$y = (2 - \sqrt[3]{x})^3$$
 تابع هست.

الف) $\frac{\sqrt[3]{x}}{\frac{1}{x}} = \sqrt[3]{x}$ $\frac{\sqrt[3]{x}}{\frac{1}{x}} = \sqrt[3]{x}$
 ج) $-\frac{1}{\frac{1}{x}} = -\frac{1}{\sqrt[3]{x}} = -\frac{\sqrt[3]{x}}{x}$ $-\frac{1}{0}$ تعریف نشده

الف) $\sin \alpha = \frac{1}{\sqrt{2}}$ $D_f = \{2k\pi + \frac{\pi}{4}\} \cup \{2k\pi + \pi - \frac{\pi}{4}\}$

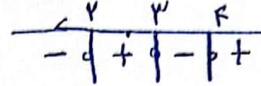
ب) $\cos \alpha = \frac{\sqrt{2}}{2}$ $D_f = \{2k\pi + \frac{\pi}{4}\} \cup \{2k\pi - \frac{\pi}{4}\}$ $D_f = \{2k\pi \pm \frac{\pi}{4}\}$





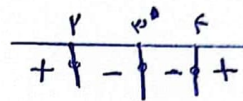
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الف) $n=2, n=3, n=4$

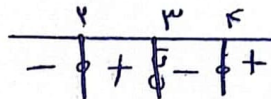


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ب) $n=2, n=3^*, n=4$

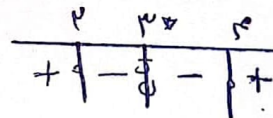


الف) $n=2, n=4, n=3$

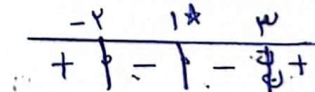


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ب) $n=2, n=4, n=3^*$

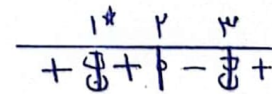


الف) $\frac{(n-1)(n+2)(n-1)}{n-3}$ $n=1^*, n=-2, n=3$

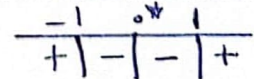


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ب) $\frac{(n-1)(n-2)}{(n-3)(n-1)}$ $n=1^*, n=2, n=3$



الف) $\frac{n^2(n^2-1)}{n^2+n+2}$ $\Delta = b^2 - 4ac$ $1 - 1 = -1 \Delta < 0$
 $n^2(n^2-1) = 0$
 $n = 0^*, n^2 = 1 \rightarrow n = \pm 1$



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ب) $\frac{n^2+n+2}{n^2+2n+2} = y$ $\Delta = b^2 - 4ac$ $4 - 16 = -12 \Delta < 0$
 $\frac{n^2+2n+2}{n^2+n+2}$ $\Delta = b^2 - 4ac$ $1 - 12 = -11 \Delta < 0$ $\oplus$