

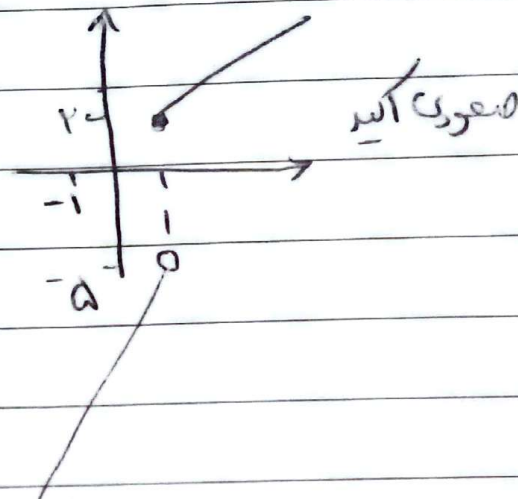
کتابخانه

دوره دوم دبیرستان

$$f(x+2) = \begin{cases} 3x+5 & x \geq 1 \\ 8x-1 & x < 1 \end{cases} \rightarrow f(x) = \begin{cases} 3x-1 & x \geq 1 \\ 8x-9 & x < 1 \end{cases} \quad (1)$$

$$3(t-2)+5 = 3t-1$$

$$8(t-2)-1 = 8t-9$$



$$y = \sqrt{f(3-x) - f(x+1)}$$

$$f(3-x) - f(x+1) \geq 0$$

$$f(3-x) \geq f(x+1) \rightarrow 3-x \geq x+1 \rightarrow 2x \leq 2 \rightarrow x \leq 1$$

$$D_y = (-\infty, 1]$$

$$f(x) = (x^3 + x)^{\frac{1}{3}} \quad \text{صورتی}$$

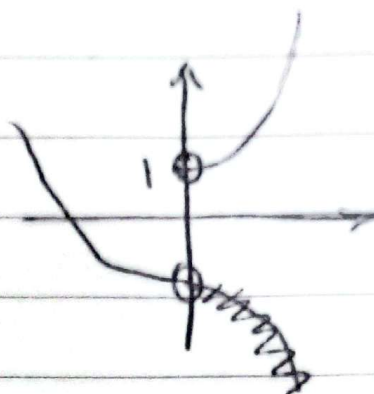
$$f \circ f(x) < f(x^3)$$

$$f(x^3 + x)^{\frac{1}{3}} < f(x^3) \rightarrow (x^3 + x)^{\frac{1}{3}} < x^{\frac{1}{3}} \rightarrow x^3 + x < x^3$$

$$\rightarrow x^3 < 0 \rightarrow x < 0 \rightarrow (-\infty, 0)$$

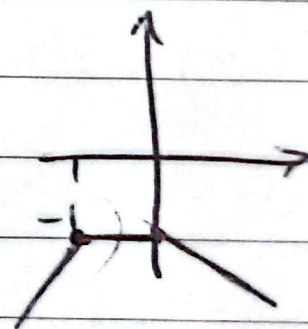
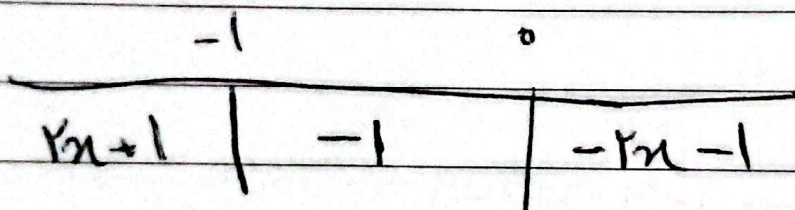
$$y = \ln\left(x^2 + \frac{1}{x}\right)$$

$$y = \begin{cases} x^3 + 1 & x > 0 \\ -x^3 - 1 & x < 0 \end{cases}$$



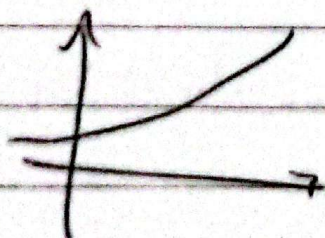
غیر یکپوا است

$$f(x) = \frac{x+1}{|x| - |x+1|} \quad (-\infty, a] \text{ معرک}$$



$$a = -1$$

$$y = \log\left(\frac{x^2 - 2x - 1}{x}\right) = -\log\left(\frac{x^2 - 2x - 1}{x}\right) = \log\left(\frac{1}{x^2 - 2x - 1}\right)$$



$$\frac{1}{x^2 - 2x - 1} > 0 \rightarrow x^2 - 2x - 1 > 0$$

$$(x-2)(x+1) > 0$$

$$x < -1 \cup x > 2$$

$$\frac{-2}{+} \frac{\epsilon}{+}$$

$$f(x) = (a^x - 1)^n$$

②

الف

$$a^x - 1 > 1 \leadsto a^x > 2 \leadsto |a| > 1$$

$$a > 1 \cup a < -1$$

ب

$$\S a^x - 1 > 1 \leadsto a > 1, a < -1$$

$$a^x - 1 = 0 \leadsto a^x = \pm \sqrt{x}$$

$$(-\infty, -1] \cup [1, +\infty) \cup \{\pm \sqrt{x}\}$$

③

$$f(x) = x^n + ax^r + bx + c$$

$$(-1, -1)$$

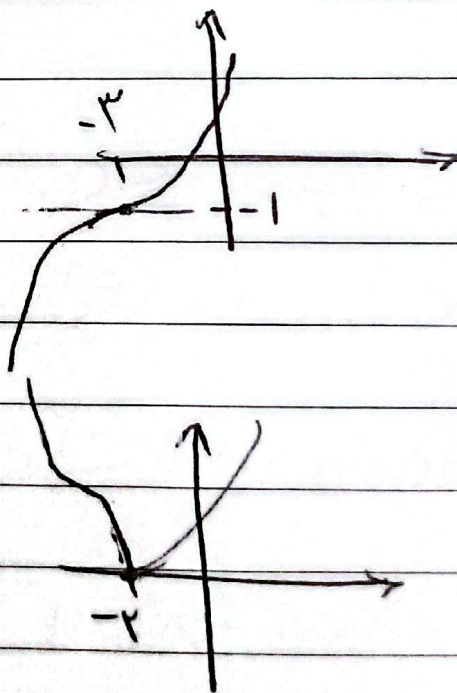
$$f(x) = (x+1)^n - 1$$

$$= x^n + nx^{n-1} + \dots + nx + 1$$

$$f(x) = 0 \rightarrow x = -1$$

$$[-1, +\infty)$$

$$x = -1$$



$$f(n) = n + \sqrt{n} - 2 \quad \text{میرزا علی}$$

①

$$f(n) \leq f(\sqrt{n})$$

$$f(n + \sqrt{n} - 2) \leq f(\sqrt{n}) \rightarrow n \geq 0$$

$$n + \sqrt{n} - 2 \leq \sqrt{n} \rightarrow n - 2 \leq 0 \rightarrow n \leq 2$$

$$[0, 2] \quad \{0, 1, 2\} \rightarrow \mathbb{N}$$

$$f(n) = \sqrt[p]{9 \cos^p n - 1} - \sqrt[p]{1 - 9 \cos^p n}$$

②

$$-1 \leq \cos n \leq 1 \rightarrow 0 \leq \cos^p n \leq 1 \rightarrow 0 \leq 9 \cos^p n \leq 9$$

$$-1 \leq 9 \cos^p n - 1 \leq 1 \rightarrow -1 \leq \sqrt[p]{9 \cos^p n - 1} \leq 1$$

$$-1 \leq 1 - 9 \cos^p n \leq 1 \rightarrow -1 \leq \sqrt[p]{1 - 9 \cos^p n} \leq 1$$

$$\cos^p n = 0 \rightarrow f(n) = \sqrt[p]{-1} - \sqrt[p]{1} = \frac{1}{p} - \frac{\varepsilon}{p} = -\frac{\varepsilon}{p}$$

$$\cos^p n = 1 \rightarrow f(n) = \sqrt[p]{p} - \sqrt[p]{-p} = \varepsilon - \frac{1}{\varepsilon} = \frac{10}{\varepsilon}$$

$$\left[-\frac{\varepsilon}{p}, \frac{10}{\varepsilon}\right]$$

$$f(n) = n - [n+1] = n - [n] + 1 \rightarrow R, E, B, U \quad (1)$$

$$g(n) = \frac{r^n - r^{-n}}{r} \rightarrow \text{Geo } r, |r| > 1 \quad D_g \rightarrow \text{gof} \rightarrow$$

$$g(-r) = \frac{r^{-r} - r^r}{r} = \frac{\frac{1}{r} - r}{r} = \frac{-1a}{1}$$

$$g(-1) = \frac{r^{-1} - r}{r} = \frac{\frac{1}{r} - r}{r} = \frac{-r}{r}$$

$$R = \left[\frac{-1a}{1}, \frac{-r}{r} \right)$$