

$$f(x+r) = \begin{cases} r_{n+1} + \omega & n \geq 1 \\ \epsilon n - 1 & n < 1 \end{cases} \rightarrow f(x) = \begin{cases} r_n - 1 & n \geq 3 \\ r_{n-1} & n < 3 \end{cases} \rightarrow \text{معدود}$$

$$x+r=t \rightarrow x=t-r \rightarrow r_{n+1} + \omega = r(t-r) + \omega = r_t - 1$$

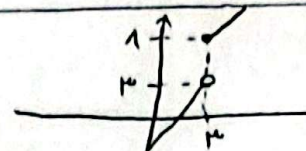
$$\epsilon n - 1 = \epsilon(t-r) - 1 = \epsilon t - 1$$

$$n \geq 1 \rightarrow t-r \geq 1 \rightarrow t \geq r+1$$

$$n < 1 \rightarrow t-r < 1 \rightarrow t < r+1$$

$$y = \sqrt{f(r-n) - f(n+1)} \rightarrow f(r-n) - f(n+1) \geq 0 \rightarrow f(r-n) \geq f(n+1) \rightarrow$$

$$r-n \geq n+1 \rightarrow n \leq 1 \rightarrow D_f = (-\infty, 1]$$



(1)

$$f(x) = (x^3 + x)^3 \rightarrow \text{معدود}$$

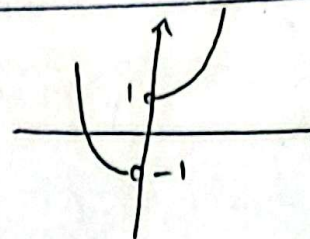
(2)

$$f \circ f(n) < f(n^3) \rightarrow f(x) < x^3 \rightarrow (x^3 + x)^3 < x^3 \rightarrow x^3 + x < x \rightarrow x^3 < 0 \rightarrow x < 0 \rightarrow$$

$$x \in (-\infty, 0)$$

$$y = |x| \left(x^2 + \frac{1}{x} \right) \xrightarrow{x \geq 0} x \left(x^2 + \frac{1}{x} \right) = x^3 + 1$$

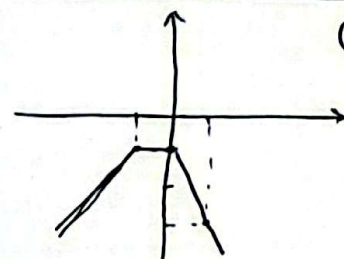
$$\xrightarrow{x < 0} -x \left(x^2 + \frac{1}{x} \right) = -(x^3 + 1)$$



(3)

$$f(x) = \frac{r_{n+1}}{|n| - |n+1|} \rightarrow \frac{r_{n+1}}{n+1} = \frac{r_{n+1}}{n+1} = \frac{r_{n+1}}{n+1} = -(r_{n+1})$$

$$x \in (-\infty, 0] \rightarrow a = 0$$



(4)

$$y = \log \frac{x^2 - rx - 1}{\frac{1}{r}}$$

$$\rightarrow x^2 - rx - 1 \rightarrow \text{الباترون} \rightarrow \text{بعض: الباترون}$$

$$\rightarrow \log \frac{x}{\frac{1}{r}} \rightarrow \text{الباترون}$$

$$x^2 - rx - 1 = y \rightarrow (-\infty, x_{\min}) \rightarrow x_{\min} = \frac{-b}{2a} = \frac{r}{2} = 1 \rightarrow (-\infty, 1]$$

(5)

$$\begin{cases} a^2 \\ a^n \\ a^x \end{cases}$$

$$\begin{cases} a > 1 \rightarrow \text{معدود الير} \\ a = 1 \rightarrow \text{معدود الير} \\ 0 < a < 1 \rightarrow \text{معدود الير} \end{cases}$$

$$\rightarrow \text{معدود الير} \rightarrow \text{معدود الير} \rightarrow \text{معدود الير}$$

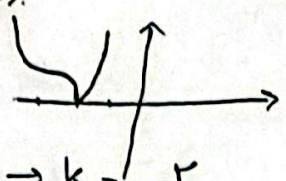
$$f(x) = (a^2 - 3)^x \quad (6)$$

$$a^2 - 3 > 1 \rightarrow a^2 > 4 \rightarrow |a| > 2 \rightarrow a > 2, a < -2$$

$$a^2 - 3 < 1 \rightarrow a^2 < 4 \rightarrow |a| < 2 \rightarrow a < 2, a > -2$$

$$f(x) = x^3 + ax^2 + bx + c \rightarrow f(x) = (x+m)^3 + n \rightarrow (-1, -1) \rightarrow m = 1, n = -1 \rightarrow (7)$$

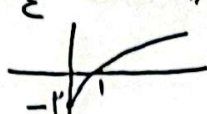
$$g(x) = x^3 \rightarrow (0, 0) \text{ when } x=0, y=0$$

$$f(x) = (x+1)^3 - 1 \rightarrow |f(x)| = |(x+1)^3 - 1|$$


$$(x+1)^3 - 1 = 0 \rightarrow x+1 = 1 \rightarrow x = 0 \rightarrow (-1, +\infty) \rightarrow k = -1$$

→ المبراهنة →

$$f(x) = x + \sqrt{x} - 2 = (\sqrt{x} + \frac{1}{\sqrt{x}})^2 - \frac{9}{4} \rightarrow \sqrt{x} \geq 0 \rightarrow (\sqrt{x} + \frac{1}{\sqrt{x}})^2 \geq \frac{1}{4} \rightarrow (8)$$

$$(\sqrt{x} + \frac{1}{\sqrt{x}})^2 - \frac{9}{4} \geq -1 \rightarrow \text{محدود} \rightarrow$$


$$f_0 f(x) \leq f(\sqrt{x}) \rightarrow f(x) \leq \sqrt{x} \rightarrow x + \sqrt{x} - 2 \leq \sqrt{x} \rightarrow x \leq 2 \rightarrow 0 \leq x \leq 2 \rightarrow 0, 1, 2$$

← مجموع 3

$$f(x) = \sqrt[3]{9\cos^2 x - 1} - \sqrt[3]{-9\cos^2 x + 1} \rightarrow f(x) = t + \frac{1}{t} \xrightarrow{t>0} t + \frac{1}{t} \geq 2 \quad (9)$$

$$\min t \rightarrow \sqrt[3]{9\cos^2 x - 1} = \sqrt[3]{-1} = -1 \rightarrow \frac{1}{-1} + 2 = \frac{5}{2}$$

$$\max t \rightarrow \sqrt[3]{9\cos^2 x - 1} = \sqrt[3]{1} = 1 \rightarrow 1 + \frac{1}{1} = 2 \rightarrow \left[\frac{5}{2}, \frac{11}{2} \right] \rightarrow$$

a' b

$$b-a = \frac{\sqrt{5}}{2}$$

$$f(x) = x - [x+1] \rightarrow x - [x] + 1 = f(x) \rightarrow R_f = [1, 1) \quad (10)$$

$$R_f = D_g \rightarrow g(r) = \frac{r^2 - r^{-2}}{r} = \frac{r - \frac{1}{r}}{r} = \frac{1}{r}$$

$$g(r) = \frac{r^2 - r^{-2}}{r} = \frac{r^4 - 1}{r^3} \rightarrow R_{g \circ f} = \left[\frac{1}{1}, \frac{4}{14} \right)$$