

$$f(x) = \sqrt{3} \sin(x + \pi/6) - 1 \rightarrow -1 \leq \sin(x + \pi/6) \leq 1 \xrightarrow{\text{نمى}} 0 \leq \sqrt{3} \sin(x + \pi/6) \leq \sqrt{3} \rightarrow -1 \leq f(x) \leq \sqrt{3} - 1$$

$$\xrightarrow{\text{نمى}} 0 \leq \sqrt{3} \sin(x + \pi/6) \leq \sqrt{3} \xrightarrow{\text{نمى}} -1 \leq \sqrt{3} \sin(x + \pi/6) - 1 \leq \sqrt{3} - 1 \rightarrow -1 \leq f(x) \leq \sqrt{3} - 1$$

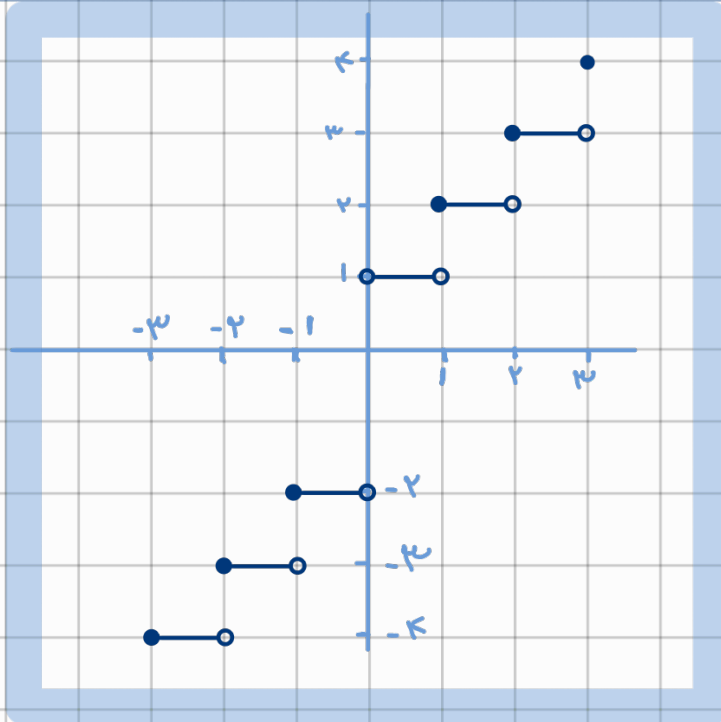
$$R_f = [-1, \sqrt{3} - 1]$$

$$g(x) = \sqrt{3} \cos^2 x - 1 \rightarrow -1 \leq \cos^2 x \leq 1 \xrightarrow{\text{نمى}} -1 \leq \sqrt{3} \cos^2 x \leq \sqrt{3} \xrightarrow{\text{نمى}} -1 \leq \sqrt{3} \cos^2 x - 1 \leq \sqrt{3} - 1$$

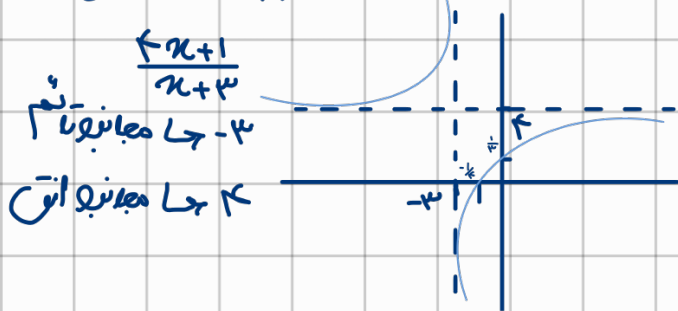
$$\xrightarrow{\text{نمى}} -1 \leq \sqrt{3} \cos^2 x - 1 \leq -1 \rightarrow -1 \leq g(x) \leq \sqrt{3} - 1$$

$$R_g = [-1, \sqrt{3} - 1]$$

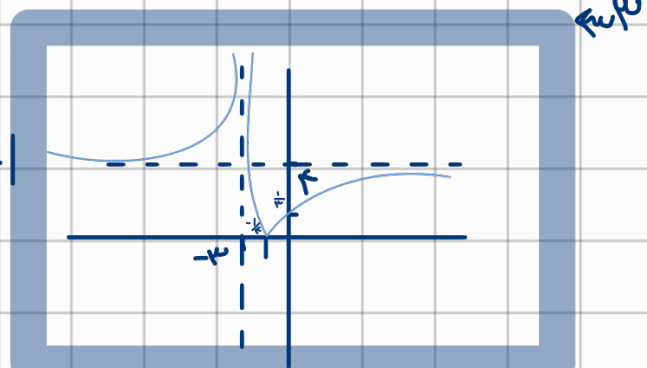
$$g_1 = \frac{x}{|x|} + [x]$$



$$g_1 = \left| \frac{x+1}{x+3} \right| \rightarrow$$



$$\rightarrow g_2 = \left| \frac{x+1}{x+3} \right|$$



$$y = |x-2| + |y-1| = 3 \Rightarrow$$

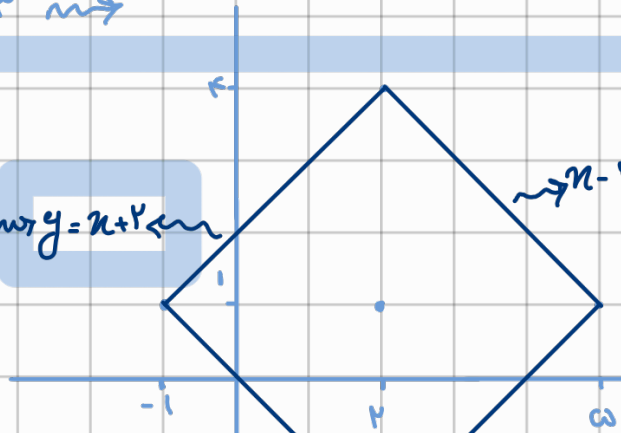
← 2, 1

$$-x+2+y-1=3 \Rightarrow y=x+2 \leftarrow$$

$$\Rightarrow x-2+y-1=3 \Rightarrow y=-x+6$$

$$-x+2-y+1=3 \Rightarrow y=-x-1 \leftarrow$$

$$\Rightarrow x-2-y+1=3 \Rightarrow y=x-6$$



← 2, 1, 4, 5

$$f(x) = x + \frac{1}{x} + 2\sqrt{x+1}$$

$$\Rightarrow x + \frac{1}{x} \geq 0 \Rightarrow x \geq 0 \Rightarrow x + \frac{1}{x} \geq 2$$

$$\Rightarrow (\sqrt{x+\frac{1}{x}})^2 + 2(\sqrt{x+\frac{1}{x}})$$

$$x + \frac{1}{x} \geq 2 \Rightarrow (\sqrt{x+\frac{1}{x}})^2 + 2\sqrt{x+\frac{1}{x}} = 2 + 2\sqrt{x+\frac{1}{x}}$$

$$\Rightarrow P_f = [2 + 2\sqrt{2}, +\infty)$$

$$y = (3 - \sin x)(1 + \sin x) \Rightarrow -\sin^2 x + 2\sin x + 3 \xrightarrow{\sin x = 1} -1 + 2 + 3 = 4 \leftarrow \text{max}$$

$$\xrightarrow{\sin x = -1} -1 - 2 + 3 = 0$$

$$\Rightarrow P_y = [0, 4]$$

← 2

$$f(n) = -\frac{1}{n}n + 10 \quad D_f = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$\text{sum of } f(n) = \left(-\frac{1}{1} \times 1 + 10\right) + \left(-\frac{1}{2} \times 2 + 10\right) + \dots + \left(-\frac{1}{9} \times 9 + 10\right) \Rightarrow$$

$$-\frac{1}{1} (1+2+3+\dots+9) + 10+10+\dots+10 = -\frac{1}{1} \times \frac{9 \times 10}{2} + 9 \times 10 = 40.5 \leftarrow \text{max}$$

$$f(x) = \sqrt{ax^2 + bx + c} \quad \text{mit } D_f = [1, +\infty) \rightarrow \text{Zur } D_f \text{ gehört } x=1 \text{ also ist } f(1) \text{ definiert} \rightarrow a=0 \text{ (1)}$$

$$f(x) = \sqrt{bx + c} \quad \text{mit } f(1) = 0 \text{ also } x=1 \text{ ist in } D_f \text{ (1)} \rightarrow 0 = \sqrt{1b + c} \rightarrow 0 = 1b + c \rightarrow c = -1b \text{ (2)}$$

$$f(x) = 1 \quad \text{mit } 1 = \sqrt{1b - 1b} \rightarrow b = 1 \rightarrow c = -1 \text{ (3)}$$

$$g(x) = \sqrt{bx^2 + ax - 1c} \quad \text{mit } g(x) = \sqrt{x^2 + 1} \quad \left. \begin{array}{l} (x \rightarrow +\infty) \rightarrow (+\infty)^2 + 1 = +\infty \\ (x \rightarrow -\infty) \rightarrow (-\infty)^2 + 1 = +\infty \\ (x = 0) \rightarrow 0 + 1 = 1 \end{array} \right\} \rightarrow$$

$$D_{g_1} = \sqrt{[1, +\infty)} \rightarrow D_{g_2} = [1, +\infty)$$

$$f(x) = \frac{x^2 - 1x}{x+1} = \frac{x(x-1)}{x+1} = \frac{x(x-1)(x+1)}{x+1} = x(x-1) \quad \text{mit } x \neq -1 \rightarrow b=1, c=-1 \text{ (1)}$$

$$x(x-1) \neq 1 \rightarrow x \neq 1 \rightarrow \{a, b\} = \{-1, 1\}$$

$$\rightarrow x^2 - 1x \quad \text{mit } x = \frac{-b}{2a} = 1 \rightarrow 1 - 1 = 0 \rightarrow c = -1$$

$$f\left(\frac{a+b}{2c}\right) = f\left(\frac{-1+1}{-1 \times 1}\right) = f(-1) = -1(-1-1) = 1$$

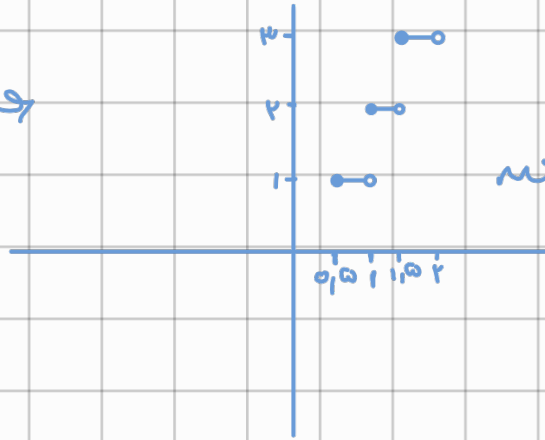
$$g = \sqrt{x^2 + ax^2 + bx - 1} \quad \text{mit } g(x) = \sqrt{(x-1)^2} \rightarrow g = x-1 \quad \left. \begin{array}{l} x^2 - 4x^2 + 12x - 1 \rightarrow a = -4 \\ b = 12 \end{array} \right\} \rightarrow$$

$$\Rightarrow D_g = [-9, 14] \Rightarrow -9 \leq x \leq 14 \xrightarrow{-9} -1 \leq x-9 \leq 10 \Rightarrow -1 \leq g_x \leq 10 \Rightarrow$$

$$D_g = [-1, 10]$$

$$g_x = [x] + [x + \frac{1}{4}] \Rightarrow$$

$$\begin{matrix} 1 + 1/4 \\ 1 + 1 \end{matrix}$$



$$\Rightarrow \int_{-1}^{10} g_x dx$$

← 10