

19, 18

مسألة

الف) $f(x) = r \sin^2(x + \frac{\pi}{4}) - 1$

-1

(2)

$$-1 \leq \sin(x + \frac{\pi}{4}) \leq 1 \rightarrow 0 \leq \sin^2(x + \frac{\pi}{4}) \leq 1$$

$$0 \leq r \sin^2(x + \frac{\pi}{4}) \leq r \rightarrow -1 \leq r \sin^2(x + \frac{\pi}{4}) - 1 \leq r - 1$$

$$R_f = [-1, 1]$$

ب) $g(x) = r \cos^2 x - r$

$$-1 \leq \cos x \leq 1 \rightarrow -1 \leq \cos^2 x \leq 1$$

$$-r \leq r \cos^2 x \leq r$$

$$-r \leq r \cos^2 x - r \leq 0$$

$$R_f = [-r, 0]$$

$$-r \leq 2r - r \rightarrow |x| = -x \rightarrow \frac{x}{|x|} = -1 \rightarrow y = -r \quad (1, 18)$$

$$[x] = -r$$

$$-r \leq x \leq -1 \rightarrow |x| = -x = \frac{x}{|x|} = -1 \rightarrow y = -r$$

$$[x] = -r$$

$$-1 \leq x \leq 0 \rightarrow |x| = -x = \frac{x}{|x|} = -1 \rightarrow y = -r$$

$$[x] = -1$$

$$0 \leq x \leq 1 \rightarrow |x| = x = \frac{x}{|x|} = 1 \rightarrow y = r$$

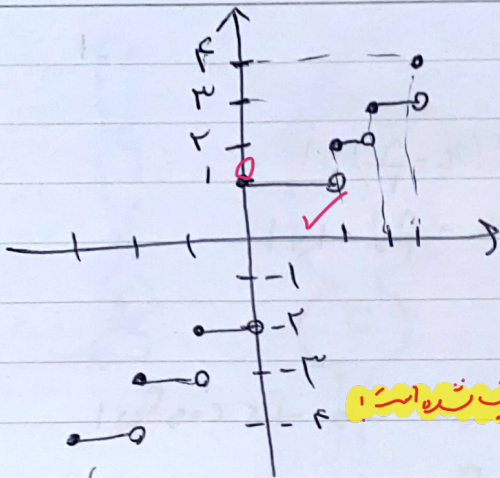
$$1 \leq x \leq r \rightarrow |x| = x = \frac{x}{|x|} = 1 \rightarrow y = r$$

$$r \leq x \leq r \rightarrow |x| = x = \frac{x}{|x|} = 1 \rightarrow y = r$$

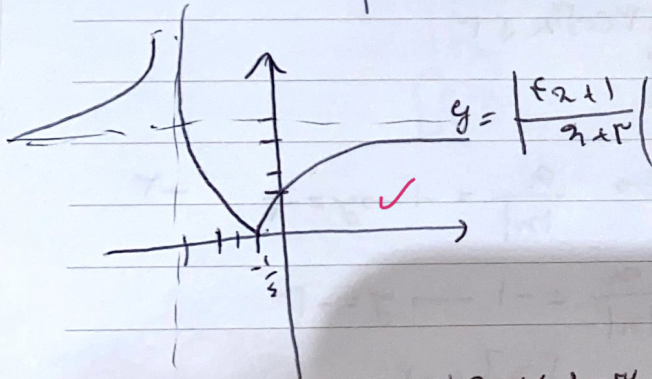
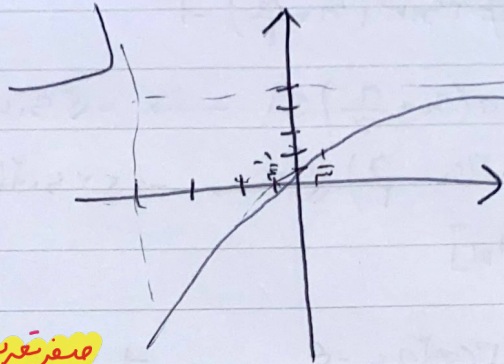
$$x = r \rightarrow y = r$$

Date

No



صفر تعریف شده است



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

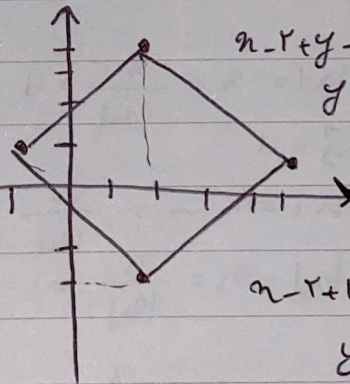
✓ $y =$ جانب راستی
 $-1 =$ جانب چپ

$$x - x + y - 1 = 1$$

$$y = x + 1$$

$$x - x + 1 - y = 1$$

$$y = -x$$



$$x - x + y - 1 = 1$$

$$y = -x + 1$$

$$x - x + 1 - y = 1$$

$$y = x - 1$$

$$f(x) = x + \frac{1}{x} + \sqrt{x + \frac{1}{x}} \rightarrow x + \frac{1}{x} \geq 0$$

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

$$\frac{-6}{2x} = -1 \Rightarrow x = 3$$

$$R_f = [3, +\infty)$$

$$\therefore y = (r \sin \alpha)(1 + \sin \alpha) = r + r \sin \alpha - \sin \alpha - \sin^2 \alpha =$$

$$-\sin^2 \alpha + r \sin \alpha + r$$

$$\begin{array}{l} \sin \alpha \begin{cases} -1 - r + r = 0 \\ -1 + r + r = 0 \end{cases} \\ \frac{-b}{2a} = \frac{-r}{-2} = 1 \end{array}$$

$$R_f = [0, 5]$$

$$D_f = \{1, 5, 7, 9, 1, 5, 7, 9\}$$

$$\frac{1}{r} \times 1 + 1 + \frac{1}{r} \times r + 1 + \dots + \frac{1}{r} \times 9 + 1 = -\frac{1}{r} (1 + r + \dots + 9)$$

$$= -\frac{1}{r} \times 48 + 9 = 9 - 18 = -9$$

$$f(x) = \sqrt{ax^2 + bx + c} \quad ax^2 + bx + c \geq 0$$

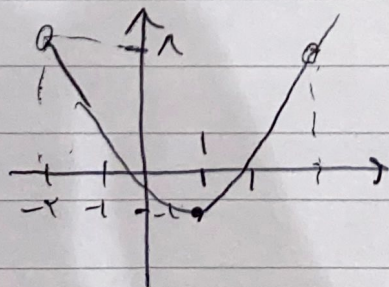
$$f(x) = \sqrt{rx + c} = 1 \quad \begin{array}{l} \sqrt{rx + c} \leftarrow a \neq 0 \\ rx + c \leftarrow a = 0 \end{array}$$

$$\begin{array}{l} \text{rew} \rightarrow rx + c = 1 \\ rx + c = 0 \end{array} \quad \begin{array}{l} b=1, c=-r \\ g(x) = \sqrt{x^2 + 1} \end{array}$$

min(0, 1)

$$R_g = \sqrt{1, +\infty} = [1, +\infty)$$

$$f(x) = \frac{x^2 - 1}{x + 1} = \frac{(x-1)(x+1)}{(x+1)} \quad \frac{x \neq -1}{x^2 - 1} \quad (1) \quad (2)$$



$$x^2 - 1 - 1 = 0 \rightarrow (x-1)(x+1) = 0$$

$$x = 1, x = -1$$

$$\{a, b\} = \{-1, 1\} \quad f\left(\frac{a+b}{2}\right) = f(0) = -1$$

$$\min(1, -1) \quad R_f = [-1, +\infty) \rightarrow C = -1$$

$$y = \sqrt[3]{x^3 + ax^2 + bx - 1} \longrightarrow y = \sqrt[3]{(x-1)^3} =$$

(2) 4

$$\sqrt[3]{x^3 - 4x^2 + 11x - 1} \longrightarrow a = -4, b = 11$$

$$-4.5.11 \longrightarrow -1.5.11 \longrightarrow R_f = [-1, 1]$$

$$y = [x] + \left[x + \frac{1}{x}\right]$$

(2) 6

$$\frac{1}{x} \leq x \leq 1 \longrightarrow 1 \leq x + \frac{1}{x} \leq \frac{x}{x} \longrightarrow [x] + \left[x + \frac{1}{x}\right] = 0 + 1 = 1$$

$$1 \leq x \leq \frac{x}{x} \longrightarrow \frac{x}{x} \leq x + \frac{1}{x} \leq 1 \longrightarrow [x] + \left[x + \frac{1}{x}\right] = 1 + 1 = 2$$

$$\frac{x}{x} \leq x \leq 1 \longrightarrow 1 \leq x + \frac{1}{x} \leq \frac{1}{x} \longrightarrow [x] + \left[x + \frac{1}{x}\right] = 1 + 1 = 2$$

