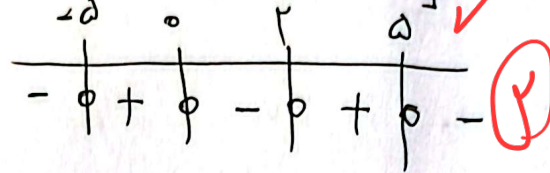
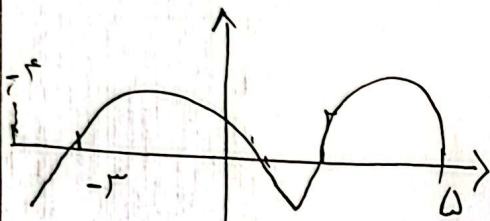


$$y = \sqrt{x \cdot f(x)} \rightarrow x \cdot f(x) \geq 0$$

$$D_f = [2, 5] \cup [-5, 0]$$



۱



$$y = \sqrt{\frac{-x}{f(x)}} \quad \begin{cases} x > 0 \\ f(x) < 0 \end{cases} \rightarrow (0, 2)$$

$$f(x) \neq 0 \quad \begin{cases} x < 0 \\ f(x) > 0 \end{cases} \rightarrow (-2, 0)$$

$$D_f = (-2, 0) \cup (0, 2)$$

تعداد صحیح

۲

$$f(x - 2)f(x) = x^2 - 2x + 4$$

جابجایی $f(x) \leftarrow f(x-2)$

$$f(2) - 2f(2) = 4 - 2 + 4 \rightarrow -f(2) = 2 \rightarrow f(2) = -2$$

$$f(-2) + 4 = 4 + 4$$

$$f(-2) = 0$$

با این روش ده از جمله بدست می آید $f(-2) \leftarrow f(2) = -2$

۳

$$f(x) = \begin{cases} x - \sqrt{x+4} & x > 2 \\ 2x+3 & x \leq 2 \end{cases}$$

$$f(f(5)) + f(f(1)) = 2 + 7 = 9$$

$$f(2) = 7$$

$$f(5) = 2$$

۴

$$f(x) = ax^2 - bx + 2$$

$$f(x-1) - f(x) = 6x + 2$$

$$x=0 \rightarrow f(-1) - f(0) = 2$$

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

$$\Rightarrow f(1) = 2 - 1 = -1$$

$$f(1) = -6$$

$$x=0 \rightarrow f(0) = 2$$

$$x=1 \rightarrow f(1) = a - b + 2 \rightarrow a - b = f(1) - 2$$

$$a - b = -6 - 2 = -8$$

$$a - b = -1$$

۵

$$f(x) = \frac{(x+1)^2 + 1}{(x+1)^2 + 3}$$

(عبدالرشيد كمال)

$$f(\sqrt{3}-1) = \frac{(\sqrt{3})^2 + 1}{(\sqrt{3})^2 + 3} = \frac{3+1}{3+3} = \frac{4}{6} = \frac{2}{3}$$

$$f(x) = \{(1,0), (1,-1), (0,1), (1,1)\} \rightarrow \eta_f = \{1,1,0,1\}$$

$$g(x) = \sqrt{9-x^2} \rightarrow 9-x^2 \geq 0 \rightarrow x^2 \leq 9 \rightarrow \eta_g = [-3,3]$$

$$\frac{f}{g} = \left\{ \left(0, \frac{1}{3}\right), (1, 0), \left(1, \frac{-1}{\sqrt{2}}\right) \right\}$$

$$\frac{g}{f} = \left\{ \left(1, \frac{\sqrt{2}}{-1}\right), \left(0, \frac{1}{1}\right) \right\}$$

$$f\left(x - \frac{1}{x}\right) = \frac{x^4 + 1}{x^2}$$

$$\frac{x^4 + 1}{x^2} = \frac{x^4}{x^2} + \frac{1}{x^2} = x^2 + \frac{1}{x^2} = \left(x - \frac{1}{x}\right)\left(x - \frac{1}{x}\right) + 2$$

$$f\left(x - \frac{1}{x}\right) = \left(x - \frac{1}{x}\right)^2 + 2$$

$$f(0) = 0^2 + 2 = 2$$

$$f(-3) = (-3)^2 + 2 = 9 + 2 = 11$$

$$f(x) = \{(1,1), (1,2), (-2,1), (1,-1)\}$$

$$2f(x) = \{(2,2), (2,4), (-4,2), (2,-2)\}$$

$$f(x)+1 = \{(1,2), (1,3), (-2,2), (1,0)\}$$

$$2f(x)+1 = \{(2,3), (2,5), (-4,3), (2,1)\}$$

$$f(x) = \{(1,1), (1,2), (-2,1), (-2,-1)\}$$

$$f(x) = \{(1,2), (1,1), (1,4), (1,3), (1,5)\}$$

$$g(x) = \{(1,1), (1,2), (-1,1), (-1,2), (1,-1)\}$$

$$f-g = \{(1,1), (1,2), (1,3)\}$$

$$\frac{2f}{g} = \{(1,2), (1,4), (1,6)\} \rightarrow \{(1,2), (1,4)\}$$