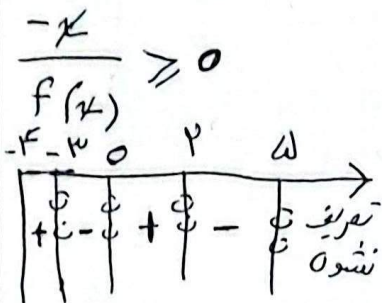


$$D_f = [-5, 0] \cup [2, 5]$$

۱



$$D_f = [-4, -3) \cup (0, 2)$$

۲

$$\begin{aligned} x=2 &\rightarrow f(2) - 2f(2) = 2 \rightarrow f(2) = -2 \\ x=-2 &\rightarrow f(-2) + 2 = 12 \rightarrow f(-2) = 10 \end{aligned}$$

۳

$$\begin{aligned} f(1) &= 5 \\ f(5) &= 2 \\ f(2) &= 7 \\ f(2) + f(5) &= 9 \end{aligned}$$

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

۴

$$f(x-1) = a(x-1)^2 - b(x-1) + 2 = ax^2 - 2ax + a - bx + b + 2$$

$$f(x-1) - f(x) = -2ax + a + b = 4x + 2$$

$$\frac{x=0}{\rightarrow} a + b = 2$$

$$\frac{x=1}{\rightarrow} -a + b = 1$$

$$\Rightarrow$$

$$a - b = -1$$

۵

$$f(1) = 1$$

$$f(-1) = 0$$

$$f(2) = -1$$

$$\frac{2f(1) + f(-1)}{f'(2)} = \frac{2 + 0}{1} = 2$$

$$f(4) = 12$$

$$f(-2) = 4$$

$$f(1) = 5$$

$$\frac{2f(4) - 2f(-2)}{f'(1)} = \frac{24 - 8}{5} = \frac{16}{5}$$

$$\begin{array}{c|c|c} P(2) = 1 & P(3) = 2 & P(1) = 4 \\ P(1) = 4 & P(4) = 4 & \end{array}$$

$$\frac{P(P(2)) - P(P(3))}{P(1) - 2} = \frac{4 - 4}{4 - 2} = \frac{0}{2} = 0$$

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

$$f(2) = \frac{21}{12}$$

$$f(f(\sqrt{x} - 2)) = \frac{21}{12}$$

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

$$(f(\sqrt{x}))' = x^{\frac{1}{2}} + \frac{1}{x^{\frac{3}{2}}} + 0$$

$$(f(\sqrt{x}))' - f(x) = x^{\frac{1}{2}} + \frac{1}{x^{\frac{3}{2}}} + 0 - \left(x + \frac{1}{x}\right) = 0$$