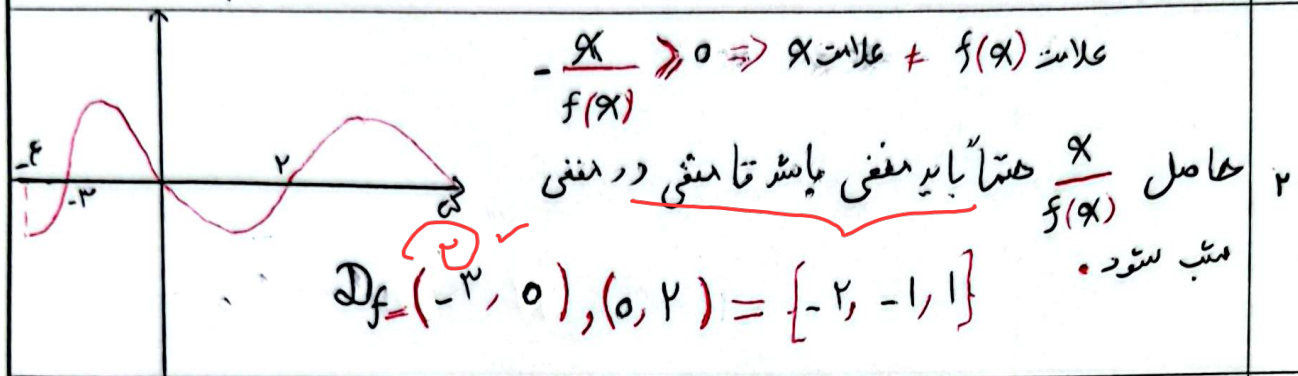
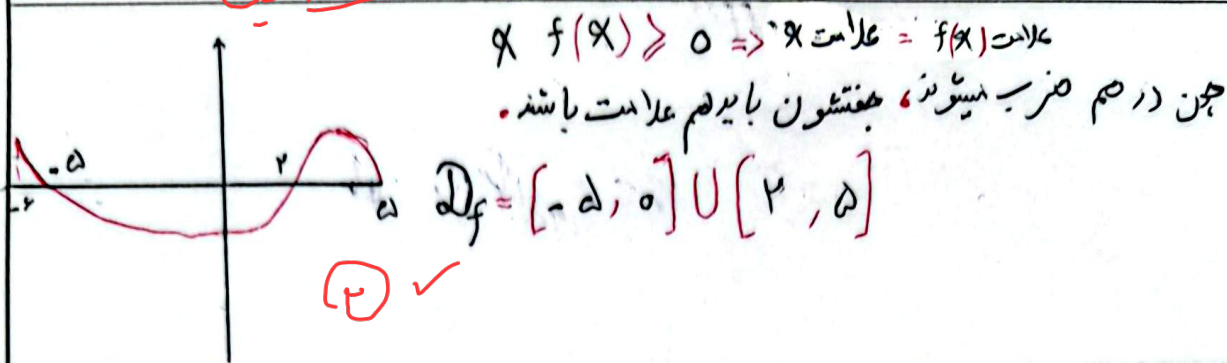




$$\begin{aligned} f(x) - 2f(2) &= x^2 - 3x + 4 \\ x=2 \Rightarrow f(2) &= 4 - 6 + 4 = 2 \Rightarrow -2f(2) = -4 \\ x=-2 \Rightarrow f(-2) &= 4 + 6 + 4 - 4 = 10 \end{aligned} \Rightarrow f(x) = x^2 - 3x + 4 - 4 = x^2 - 3x$$

$f(-2) = 10$

(۲) ✓

$f(x) = \begin{cases} x - \sqrt{x+9} & x > 3 \\ 2x + 3 & x < 3 \end{cases}$

$f(5) = 5 - \sqrt{14} = 3$
 $f(1) = 2 + 3 = 5$
 $f(2) = 7$

$f(5) + f(1) = 3 + 5 = 8 \Rightarrow 7 + 1 = 8$

$f(5) = 3$

(۲) ✓

$$\begin{aligned} f(x-1) &= a(x-1)^2 - b(x-1) + 2 = ax^2 - 2ax + a - bx + b + 2 \\ f(x-1) - f(x) &= 6x + 2 \\ ax^2 - 2ax + a - bx + b + 2 - ax^2 + bx - 2 &= 6x + 2 \\ -2ax + a + b &= 6x + 2 \end{aligned}$$

$-2a = 6 \Rightarrow a = -3$
 $a + b = 2 \Rightarrow -3 + b = 2 \Rightarrow b = 5$

$a - b = -8$

(۲) ✓

$$f(2) = 8 - 9 + 1 = -1$$

$$f(-1) = 1 + 9 + 1 = 11$$

$$f(3) = 9 - 9 + 1 = 1$$

✓

$$\left\{ \frac{2f(2) + f(-1)}{f(2)} \right\} \text{ حاصل } f(x) = x^2 - 3x + 1 \text{ اگر}$$

$$f^2(2) \rightarrow f(f(2))$$

$$f^2(2) = f(f(2)) = \frac{2 \times (-1) + 11}{-1} = \frac{-2 + 11}{-1} = \frac{9}{-1} = -9$$

$$f^2(3) = f(f(3)) = \frac{2 \times 1 + 11}{1} = \frac{2 + 11}{1} = 13$$

منظور خروجی قدر است
در باره جابجایی

$$f(x) = \begin{cases} 3x+1 & x > 2 \\ x^2 & x < 2 \end{cases}$$

$$f(4) = 3 \times 4 + 1$$

$$f(2) = 3 \times 2 + 1$$

$$f(-2) = (-2)^2$$

$$\frac{3f(4) - 2f(-2)}{f(2)}$$

$$\frac{3 \times 13 - 2 \times 4}{11} = \frac{39 - 8}{11} = \frac{31}{11}$$

$$\frac{3 \times 13 - 2 \times 4}{11} = \frac{31}{11} = \frac{31}{11}$$

$$f = \{(1, 6), (2, 7), (4, 1), (1, 6)\}$$

$$\frac{f(f(4)) - f(f(2))}{f(1) - 2} = \frac{f(1) - f(2)}{6 - 2} = \frac{6 - 7}{4} = -\frac{1}{4}$$

✓

$$f_x = \frac{x^2 + 4x + 9}{x^2 + 4x + 4} = \frac{x^2 + 4x + 4 + 5}{x^2 + 4x + 4} = 1 + \frac{5}{x^2 + 4x + 4} = 1 + \frac{5}{x(x+4) + 4}$$

$$f(\sqrt{3}-2) = 1 + \frac{5}{(\sqrt{3}-2)(\sqrt{3}+2) + 4} = 1 + \frac{5}{3 - 4 + 4} = 1 + \frac{5}{3} = \frac{8}{3}$$

$$f(2) = 1 + \frac{5}{2 \times 6 + 4} = 1 + \frac{5}{16} = \frac{21}{16}$$

✓

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

$$(f(\sqrt{x}))^2 - f(x) = 2$$

✓

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

$$\left. \begin{aligned} f(\sqrt{x}) &= x + \frac{1}{x} \\ f(\sqrt{x})^2 &= x^2 + 2 + \frac{1}{x^2} \end{aligned} \right\} \Rightarrow x^2 + 2 + \frac{1}{x^2} - x^2 - \frac{1}{x^2} = 2$$