

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

جایگاه های دو می خوریم که x و $f(x)$ هم علامت باشند

$$[-4, 0] \cup [2, 4]$$

$$y = \sqrt{\frac{-x}{f(x)}} \quad \frac{-x}{f(x)} \geq 0$$

مقدارها = -3, 0, 2, 4

از روی نمودار می بینیم

$$(-3, 0) \cup (0, 2)$$

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$$-3, -1 \quad 1, \rightarrow \quad [2]$$

$$f(x) - 2f(2) = x^2 - 3x + 4$$

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

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

$$f(x) - 2(-2) = x^2 - 3x + 4$$

$$f(x) = x^2 - 3x$$

$$f(-2) = 4 + 6 = 10$$

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

① $f(4) = 4 - \sqrt{8} = 4 - 2\sqrt{2}$

② $f(1) = 2 + 3 = 5$

$f(4) = 2$

$f(2) = 2 \times 2 + 3 = 7$

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

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

① $f(x-1) = a(x-1)^2 - b(x-1) + 2$

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

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

② $-2a = 6$

$a = -3$

③ $a + b = 2$

$-3 + b = 2$

$b = 5$

$a - b = -3 - 5 = -8$

$$f(x) = x^2 - 3x + 1$$

① $f(3) = 9 - 9 + 1 = 1$

② $f(-1) = 1 + 3 + 1 = 5$

③ $f(2) = 4 - 6 + 1 = -1$

$$2f(3) + f(-1)$$

$$f'(2)$$

$$\rightarrow \frac{2+5}{1} = 7$$

(V)

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

$$\textcircled{1} f(2) = 2^2 + 1 = 5$$

$$\textcircled{2} f(-2) = 4$$

$$\textcircled{3} f(2) = 4 + 1 = 5$$

$$\frac{f(f(2)) - f(f(-2))}{f(2)} = \frac{f(5) - f(4)}{5} = \frac{25 - 16}{5} = \frac{9}{5} = 1 \frac{4}{5}$$

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

(A)

(9)

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

$$f\left(\frac{1}{\sqrt{x} - 2}\right) = ?$$

$$f(2) = \frac{9 + 12 + 9}{9 + 12 + 4} = \frac{30}{25} = \frac{6}{5}$$

(10)

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

$$f(\sqrt{x}) = (\sqrt{x})^2 + \frac{1}{(\sqrt{x})^2} = x + \frac{1}{x} \xrightarrow{\text{Euler}} \left(x + \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} + 2$$

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