

$$f(x) = x^2 - 3x + 1 \quad \frac{f(3) - f(-1)}{f'(x)} = ? \quad f'(x) = [f(x)]^2$$

$$f(3) = 9 - 9 + 1 = ①$$

$$f(-1) = 1 - 3 + 1 = ⑤$$

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

$$\frac{f(3) - f(-1)}{f'(3)} = \frac{1 - 5}{-1} = ④$$

$$f(x) = \begin{cases} x+1 & x > 1 \\ x^2 & x < 1 \end{cases} \quad \frac{f(2) - f(-1)}{f'(x)}$$

$$f(2) = 2 + 1 = ③$$

$$f(-1) = (-1)^2 = ①$$

$$f'(x) = 2x$$

$$\frac{3 - 1}{2} = ①$$

$$f = \{(2, 4), (3, 9), (1, 1), (1, 3)\}$$

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

$$f(2) = 4$$

$$f(3) = 9$$

$$f(1) = 1$$

$$\frac{4 - 9}{1 - 3} = \frac{-5}{-2} = ② \frac{5}{2}$$

$$f(x) = \frac{x^2 + 2x + 9}{x^2 + 2x + 5}, \quad f(f(\sqrt{3} - 1)) = ?$$

$$x = \sqrt{3} - 1$$

$$f(\sqrt{3} - 1) = \frac{(\sqrt{3} - 1)^2 + 2(\sqrt{3} - 1) + 9}{(\sqrt{3} - 1)^2 + 2(\sqrt{3} - 1) + 5} = \frac{3 - 2\sqrt{3} + 1 + 2\sqrt{3} - 2 + 9}{3 - 2\sqrt{3} + 1 + 2\sqrt{3} - 2 + 5} = \frac{11}{11} = ①$$

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

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

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

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

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