

نام و نام خانوادگی: کلاس: شماره: پاسخنامه تشریحی تکلیف شماره: ۱

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

$\frac{-2x+1}{1-x} \cdot \frac{(x-1)^2 - x^2}{x(x-1)}$

$\frac{0}{1} \rightarrow D_f = (-\infty, 0) \cup (\frac{1}{2}, 1)$

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

$\frac{1}{x+1} - 1 = \frac{1 - (x+1)}{x+1} = \frac{-x}{x+1}$

$D_f = \mathbb{R} - \{-1, 0\}$

الف) $f(x) = \sqrt{(\frac{1}{x}-9)(x-4)}$

$\frac{1}{x} = 9 \Rightarrow x = \frac{1}{9}$

$D_f = (-\infty, \frac{1}{9}] \cup [4, \infty)$

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

$D_f = [1, \infty) \cup (-1, \infty)$

$f(x) = \log_e(x^2 - x - 2)$

$x^2 - x - 2 > 0 \Rightarrow (x-2)(x+1) > 0$

$D_f = (-\infty, -1) \cup (2, \infty)$

$[-2, b] = D_f$

$y = \sqrt{x^2 - 2ax - a^2}$

$a < b < 0$

$g(x) = \sqrt{f(x) - x}$

$f(x) = \begin{cases} 3x-2; & x \geq 1 \\ 2x+3; & x < 1 \end{cases}$

$D_g = [-2, 1) \cup (1, \infty)$

$$f(x) = \begin{cases} (a+1)(x+1); & x > 1 \\ x+1; & x \leq 1 \end{cases}$$

$$f'(x) = f'(-1) \rightarrow x+1 \rightarrow x+1-1$$

$$a = ? \rightarrow \frac{x+1}{1 \leq a+1 \leq 2} \rightarrow x+1 \rightarrow -1 \rightarrow a = -1/1$$

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

$$x\sqrt{4} + \epsilon$$

$$f(x-\sqrt{x}) \leq f(x+\sqrt{x}) = ?$$

$$(\sqrt{x-\sqrt{x}} + \sqrt{x+\sqrt{x}})^2$$

$$\sqrt{x-\sqrt{x}} + \frac{1}{\sqrt{x-\sqrt{x}}} + \sqrt{x+\sqrt{x}} + \frac{1}{\sqrt{x+\sqrt{x}}}$$

$$\frac{1-\sqrt{x} + \sqrt{x} + 1}{x\sqrt{x} + \sqrt{x}} \rightarrow \frac{2}{x\sqrt{x}}$$

$$f'(x) = f'(-x) = \epsilon x^2 - x$$

$$-x^2 \leq f'(x) \leq x^2 = \epsilon x^2$$

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

$$(x+1) f(x) - x f(x+1) = \epsilon x^2 - m x + x_{m-1}$$

$$f(x) = f(x+1) + \epsilon x^2 - m x + x_{m-1}$$

$$f(x) = x_{m-1} + \epsilon x^2 - m x + x_{m-1}$$

$$f(x) \rightarrow a \rightarrow b$$

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

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

$$f(-1) = -1$$