

نام و نام خانوادگی الیا مسلمان پاسخنامه تشریحی تکلیف شماره ۴ کلاس پانزدهم A

$$\text{الف)} \quad \frac{x-1}{x} - \frac{x}{x-1} \geq 0 \Rightarrow \frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \Rightarrow \frac{x^2 - 2x + 1 - x^2}{x(x-1)} \geq 0$$

$$\Rightarrow \frac{-2x+1}{x(x-1)} \geq 0$$

$$\text{ب)} \quad x+1 \neq 0 \Rightarrow x \neq -1 \quad \left. \begin{array}{l} x \neq 0 \\ \frac{x}{x-1} + \frac{1}{x+1} \neq 0 \Rightarrow \frac{x(x+1) + x-1}{(x-1)(x+1)} \neq 0 \Rightarrow \frac{x^2 + 2x - 1}{(x-1)(x+1)} \neq 0 \end{array} \right\} A$$

$$A \cap B \Rightarrow Df = (-\infty -\frac{1}{2}] \cup (1 +\infty)$$

$$\text{ج)} \quad ((\frac{1}{x})^x - 9)(3x - 5x) \geq 0 \quad \frac{-2}{x} \geq 0 \Rightarrow Df = (-\infty -2] \cup [2, +\infty)$$

$$\text{د)} \quad \sqrt{y+1} = 3 - \sqrt{x-1} \Rightarrow y+1 = (3 - \sqrt{x-1})^2 \Rightarrow y = (3 - \sqrt{x-1})^2 - 1$$

$$= 9 - 6\sqrt{x-1} + \sqrt{x-1} - 1 = 8 - 5\sqrt{x-1}$$

$$\Rightarrow x-1 \geq 0 \Rightarrow x \geq 1 \Rightarrow Df = [1 +\infty)$$

$$x^2 - x - 2 > 0 \quad \frac{-1}{2} < x < 2 \rightarrow A$$

$$x^2 - 1 \geq 0 \Rightarrow \frac{-1}{1} \leq x \leq 1 \rightarrow B$$

$$\sqrt{x^2-1} + 1 \neq 0 \Rightarrow \sqrt{x^2-1} \neq -1 \quad \checkmark$$

$$A \cap B \Rightarrow Df = (-\infty -1) \cup (2 +\infty)$$

$$-2 \times b = \frac{3}{-1} = -3 \Rightarrow -2 \times b = -3 \Rightarrow b = \frac{3}{2} \Rightarrow Df = [-2 \quad \frac{3}{2}]$$

$$\frac{3}{2} + (-2) = \frac{-a}{-1} = a = \frac{-1}{2} \Rightarrow a + b = \frac{-1}{2} + \frac{3}{2} = 1$$

$$f(x) - x \geq 0 \Rightarrow f(x) \geq x$$

$$x=1 \Rightarrow f(x)=1 \Rightarrow f(x)=x$$

$$x=3 \Rightarrow f(x)=-3$$

$$\Rightarrow Df = [-3 +\infty)$$

$$\frac{-3}{-1} + \frac{1}{1}$$

$$f(-1) = 2a - 1 \Rightarrow 2f(0) = 2a - 1 + a = 3a - 1 \Rightarrow f(0) = \frac{3a-1}{2}$$

$$\Rightarrow (a+1)(0+1) = 2a-1 \Rightarrow Va+1 = 2a-1 \Rightarrow \boxed{a = -\frac{9}{2}}$$

$$\sqrt{x-\sqrt{x}} = a \quad \sqrt{x+\sqrt{x}} = b$$

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

$$(a+b)^2 = x-\sqrt{x} + x+\sqrt{x} + 2\sqrt{x-\sqrt{x}} = 4 \Rightarrow a+b = \sqrt{4}$$

$$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{\sqrt{4}}{1} = \sqrt{4} \Rightarrow f(x-\sqrt{x}) + f(x+\sqrt{x}) = \boxed{2\sqrt{4} + 1}$$

$$\begin{cases} 2f(n) - 2f(-n) = 4n^2 - 2 \\ 2f(-n) - 2f(n) = 4n^2 - (-2) = 4n^2 + 2 \end{cases} \Rightarrow -\Delta f(n) = 4n^2 + 2$$

$$\Rightarrow f(n) = \frac{4n^2 + 2}{-\Delta} = \boxed{-\frac{4n^2 + 2}{\Delta}}$$

$$x=0 \Rightarrow 2f(0) = 2m-1 \Rightarrow f(0) = \frac{2m-1}{2}$$

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

$$\frac{2m-1}{2} = \frac{4m+2}{2}$$

$$2m-1 = 4m+2 \Rightarrow \boxed{m = -\frac{3}{2}}$$

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

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

$$\frac{2x^2 - 1}{x} = 2x + \frac{2}{x} - 1$$

$$ax+b + \frac{a}{x} + b = \frac{2x^2 - 1}{x} \Rightarrow \begin{cases} a = 2 \\ b = -1 \end{cases}$$

$$\Rightarrow f(x) = 2x - 1 \Rightarrow f(-1) = -2 - 1 = \boxed{-3}$$