

Subject :

Year :

Month :

Date :

"تلكم ع"

"نأمن"

"بأذنهم (فدع)"

"زهر الورداني"

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

$$\frac{x-1}{x} - \frac{x}{x-1} \geq 0$$

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

$$Df = (-\infty, 0) \cup [\frac{1}{2}, 1)$$

$$\frac{(x-1)^2 - x^2}{x^2 - x} = \frac{x^2 - x^2 - 2x + 1}{x^2 - x} \rightarrow \frac{-2x + 1}{x(x-1)} \geq 0$$

$$ب) f(x) = \frac{\frac{1}{x+1} - \frac{1}{x-1}}{\frac{1}{x-1} + \frac{1}{x+1}} \rightarrow \frac{x \neq 0, x \neq -1}{\frac{x}{x-1} + \frac{1}{x+1}} \neq 0 \rightarrow \frac{x(x+2) + x - 1}{(x-1)(x+2)} \rightarrow \frac{x^2 + 2x + x - 1}{(x-1)(x+2)}$$

$$\rightarrow Df = \mathbb{R} - \left\{ -2, -\frac{2}{5}, -1, 0, 1 \right\}$$

$$الف) g = \sqrt{\left(\left(\frac{1}{x}\right)^x - 9\right)(x^2 - 4^x)}$$

$$\left(\frac{1}{x}\right)^x - 9 \geq 0 \rightarrow x = -2$$

$$x^2 - 4^x \geq 0 \rightarrow x = \frac{0}{2}$$

$$Df = (-\infty, -2] \cup \left[\frac{0}{2}, +\infty\right)$$

$$ب) \sqrt{x-1} + \sqrt{y+1} \leq 3$$

$$\sqrt{y+1} \leq 3 - \sqrt{x-1} \rightarrow 3 - \sqrt{x-1} \geq 0$$

$$\sqrt{x-1} \leq 3 \rightarrow x-1 \leq 9 \rightarrow x \leq 10$$

$$Df = [1, 10]$$

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

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

$$x^2 - 1 > 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1, x \leq -1 \text{ (1)} \quad Df \cap (1) = (-\infty, -1) \cup (2, +\infty)$$

$$f(x) = \sqrt{3 + ax - x^2}$$

$$\rightarrow -x^2 + ax + 3 \geq 0$$

$$Df = [-2, b]$$

$$-2 \times b = -3 \rightarrow b = \frac{3}{2}$$

$$x^2 - ax - 3 \leq 0$$

$$(x+2)(x-b) \leq 0 \rightarrow (x+2)\left(x - \frac{3}{2}\right) \rightarrow x^2 + \frac{1}{2}x - 3 \leq 0$$

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

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

$$g(x) = \sqrt{f(x) - x} \quad 1x+3 \geq x \rightarrow x \geq -3$$

$$f(x) - x \geq 0 \rightarrow f(x) \geq x \quad Dg = [-3, +\infty)$$

SABA

$$f(x) = \begin{cases} (a+1)(x+2), & x > 1 \\ 3a+2x, & x \leq 1 \end{cases}$$

$$2(a+1)(0+2) = 3a+2(-2)+a \quad (5) - 4$$

$$4a+4 = 4a-4 \rightarrow 4a = -8$$

$$a = -2$$

$$2f(0) = f(-2) + a$$

$$a = ?$$

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

$$\sqrt{x_1} + \frac{1}{\sqrt{x_1}} + 2 + \sqrt{x_2} + \frac{1}{\sqrt{x_2}} + 2 = \sqrt{x_1 x_2} + \frac{1}{\sqrt{x_1 x_2}} + 2 + 2\sqrt{x_1 x_2}$$

$$f(\sqrt{x_1 x_2}) + f(\sqrt{x_1 x_2}) = ?$$

$$= 4 + 2\sqrt{x_1 x_2} + 2\sqrt{x_1 x_2} = 4 + 4\sqrt{x_1 x_2}$$

مطلوب هم همین
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$$2(\sqrt{x_1 x_2} + \sqrt{x_1 x_2})$$

$$x^2 = 4 \rightarrow x = \sqrt{4}$$

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

$$f(x) = ? \rightarrow 2^2 \text{ ضرب} \rightarrow 4f(x) - 3f(-x) = 16x^2 - 3x$$

$$2^3 \text{ ضرب} \rightarrow 8f(x) - 9f(-x) = 64x^2 + 9x$$

$$- 2f(x) = 16x^2 + x \rightarrow f(x) = \frac{16x^2 + x}{-8} = -2x^2 - \frac{x}{8}$$

$$(x+2)f(x) - 3xf(x+2) = 4x^2 - mx + 3m - 1$$

$$f(0) = ? \rightarrow x=0 \rightarrow 2f(0) = 3m-1$$

$$f(0) = \frac{3m-1}{2}$$

$$x=-2 \rightarrow 4f(0) = 14+3m+3m-1 \rightarrow f(0) = \frac{4m+10}{4}$$

$$\frac{3m-1}{2} = \frac{4m+10}{4}$$

$$12m-2 = 4m+10 \rightarrow 8m = 12 \rightarrow m = \frac{3}{2}$$

$$f(0) = \frac{3 \times \frac{3}{2} - 1}{2} = \frac{7}{4}$$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{3x^2 - 12x + 3}{x}$$

$$f(-1) = ? \rightarrow x=-1 \rightarrow 2f(-1) = \frac{3+12+3}{-1} \rightarrow 2f(-1) = -18$$

$$f(x) = ax+b$$

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