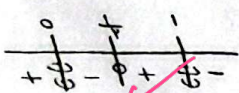


۱. تعیین اینکه آیا تابعی است یا نه

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

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

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



$$D_f: (-\infty, 0) \cup (1, +\infty)$$

$$f(x) = \int \left(\left(\frac{1}{x} \right)^x - 9 \right) (x^2 - x^3)$$

$$\left(\frac{1}{x} \right)^x - 9 = 0 \quad \left(\frac{1}{x} \right)^x = 9 \quad x^{-x} = 9 \quad x^{-x} = 3^2$$

$$-x = 2 \quad x = -2$$

$$x^2 - x^3 = 0 \quad x^2 = x^3 \quad x^2 = 2^2 \quad x^2 = 4$$

$$x = \pm 2$$

$$(x^2 - x^3) > 0 \quad x^2 > x^3 \quad x^2 > 4$$

$$D_f: (-\infty, -2) \cup (2, +\infty)$$

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

$$II) \frac{x^2 - 1}{x^2 - 1} + 1 > 0$$

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

$$D_f: \mathbb{R}$$

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

$$D_f: [-1, 3]$$

$$a + b = p$$

$$if \ x = -1 \rightarrow -1 - 2a + 3 = 0$$

$$-2a + 2 = 0 \quad -2a = -2 \rightarrow a = 1$$

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

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

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

$$D_g: \mathbb{R}$$

$$D_g: [-3, +\infty)$$

$$f(x) - x \geq 0 \quad f(x) - x = 0 \quad f(x) = x$$

$$x^2 - 2 - x \geq 0 \quad x^2 - x - 2 \geq 0 \quad (x-2)(x+1) \geq 0$$

$$D_f: [-3, +\infty)$$

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

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

$$\frac{2x + 1}{x(x+1)} > 0$$

$$D_f: \mathbb{R}$$

$$f(x) = \sqrt{x-1} + \sqrt{y+1} = 3$$

$$D_f: [1, 8]$$

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

$$D_f: (-\infty, -1) \cup (2, +\infty)$$

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

$$D_f: (-\infty, -1) \cup (1, +\infty)$$

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$$f(\sin \frac{\pi}{4} + \cos \frac{\pi}{4}) = p$$

$$f(a) = \frac{1}{\frac{1}{4} + 1 + \sqrt{\frac{1}{4}}} - \frac{1}{\frac{1}{4} + 1 + \sqrt{\frac{1}{4}}} = \frac{1}{4} - \frac{1}{4} = -\frac{1}{4}$$

مقامی

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

$$\frac{a+1}{a-1} - 1 = a$$

مسئله: با توجه به معادله ی زیر، a را به طوری تعیین کنید که معادله دارای دو جواب باشد.

$a \in \mathbb{R}$

$$Q = P$$

$$(x-y)^2 = 0 \rightarrow x = y$$

$$\beta_{x+1} = \beta \rightarrow \beta = \beta$$

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

بدلی بدست آوردن $f(-4)$:

$$f(x, y) = \frac{x^{\frac{3}{2}}}{-x} = -\frac{3}{2}$$

$$\cos \alpha \begin{cases} \frac{v}{r} = -1/\sqrt{2} & \text{GGE} \quad \frac{v}{r} = -1/\sqrt{2} \cos \alpha \\ \frac{p}{r} = \frac{1}{p} \quad \checkmark \end{cases}$$

ماشاء الله از تصحيح باحوط ملي شاه