

۱۹۱۵ آفرین دی بلف سوالات ۱ به ترتیب بنویس

$$f(x) = \sqrt{3+ax-x^2} \quad [-2, b]$$

$$3+ax-x^2 \geq 0 \Rightarrow -(x^2-ax-3) \geq 0 \Rightarrow$$

$$\text{جمع می شود} : -\frac{b}{a} \Rightarrow -\frac{a}{-1} = a \quad \text{ضرب می شود} : \frac{c}{a} = \frac{3}{-1} = -3$$

$$-(x+2)(x-\frac{3}{1}) \Rightarrow -(x^2+ax-3)$$

$$a+b = -0,5 + 1,5 = 1$$

$$\sqrt{\frac{x-1}{x} - \frac{x}{x-1}} \Rightarrow \frac{x-1}{x} - \frac{x}{x-1} \Rightarrow \frac{(x-1)^2 - x^2}{x(x-1)} \Rightarrow$$

(الف)

$$\frac{-2x+1}{x(x-1)} \geq 0 \quad x = 1, \frac{1}{2}, 0$$

$$\begin{array}{c} 0 \quad \frac{1}{2} \quad 1 \\ | \quad | \quad | \\ - \quad + \quad - \quad + \end{array} \Rightarrow$$

$$D_f = (0, \frac{1}{2}] \cup (1, +\infty)$$

$$\frac{1}{x+1} - \frac{2}{x} \Rightarrow \frac{3}{x-1} + \frac{1}{x+2}$$

$$\text{صورت} : \frac{x-2(x+1)}{x(x+1)} = \frac{-x-2}{x(x+1)}$$

$$\text{مخرج} : \frac{3(x+2)+(x-1)}{(x-1)(x+2)} = \frac{4x+5}{(x-1)(x+2)}$$

$$= \frac{-(x+2)^2(x-1)}{x(x+1)(4x+5)}$$

(ب)

$$R = \{-2, -1, -\frac{5}{4}, 0, 1\}$$

$$f(x) = \begin{cases} rx - r & x \geq 1 \\ rx + r & x < 1 \end{cases}$$

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

$$f(x) - x \geq 0 \Rightarrow rx - r \geq x \Rightarrow rx \geq r \Rightarrow x \geq 1$$

$$rx + r \geq x \Rightarrow x \geq -r$$

$$D_g = [-r, \infty)$$

2

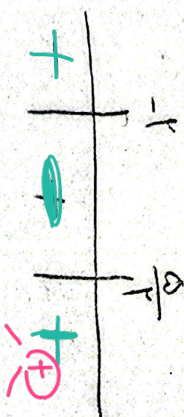
$$\sqrt{\left(\left(\frac{1}{r}\right)^x - 9\right)(rr - \varepsilon^x)}$$

(الف) - r

$$\left(\left(\frac{1}{r}\right)^x - 9\right)(rr - \varepsilon^x) \geq 0 \quad \left(\frac{1}{r}\right)^x = 9 \Rightarrow \left(\frac{1}{r}\right)^x \neq 9 \Rightarrow x = -1 \quad (1,5)$$

$$rr - \varepsilon^x = 0 \Rightarrow rr = \varepsilon^x \Rightarrow x = \frac{4}{r}$$

$$D_f = \left[-r, \frac{0}{r}\right]$$



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$$\text{و } x=1 \text{ را می بینیم} \rightarrow \left(\left(\frac{1}{r}\right)^1 - 9\right)(rr - \varepsilon^1) \rightarrow D_f = rr - (-r, \frac{0}{r})$$

$$\sqrt{x-1} + \sqrt{y+1} = r \Rightarrow x-1 \geq 0 \Rightarrow x \geq 1 \quad y+1 \geq 0 \Rightarrow y \geq -1 \quad (ب)$$

$$\sqrt{y+1} = r - \sqrt{x-1} \Rightarrow r - \sqrt{x-1} \geq 0 \Rightarrow \sqrt{x-1} \leq r \Rightarrow$$

$$x-1 \leq r^2 \Rightarrow x \leq r^2$$

$$x = [1, r^2]$$

$$f(x) = x^2 - \varepsilon x \quad g(x) = \sqrt{x^2 - 1}$$

-A

$$f(g(a)) = (g(a))^2 - \varepsilon(g(a)) = (\sqrt{a^2 - 1})^2 - \varepsilon\sqrt{a^2 - 1} = a^2 - 1 - \varepsilon\sqrt{a^2 - 1} = -\varepsilon$$

$$\Rightarrow (a^2 - 1 - \varepsilon\sqrt{a^2 - 1})^2 = 0 \Rightarrow a^4 + 4a^2 + 9 = 14a^2 - 14 \Rightarrow a^4 - 10a^2 + 14 = 0$$

$$(a^2 - 7)^2 = 0 \Rightarrow a^2 = 7 \Rightarrow a = \pm\sqrt{7}$$

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

-V

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

$$\text{for } \frac{x+1 - (x-1)}{x-1} = \frac{2}{x-1} \Rightarrow \frac{2x}{x-1} = x \Rightarrow x \neq 1$$

$$\Rightarrow f(f(a)) = a \Rightarrow a \in \mathbb{R} - \{1\}$$

$$f(x) = 2x^2 - \varepsilon x \quad f\left(\sin \frac{\pi}{\sqrt{\varepsilon}} + \cos 2\pi\right)$$

-4

$$\sin \frac{\pi}{\sqrt{\varepsilon}} = \frac{\sqrt{\varepsilon}}{\varepsilon} \quad \cos 2\pi = 1 \Rightarrow x = \frac{\sqrt{\varepsilon}}{\varepsilon} + 1$$

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

$$2\left(\frac{\sqrt{\varepsilon}}{\varepsilon} - 1\right)^2 = 2\left(\frac{\varepsilon}{\varepsilon} - 1\right) = 2\left(-\frac{1}{\varepsilon}\right) = -\frac{2}{\varepsilon}$$

B. $\frac{2}{\varepsilon}$ new line

$$f(\epsilon \cos^2 x + \Delta \cos x) = \tan^2 x$$

-10

$$\cos^2 x + \Delta \cos x = 1, \Delta \Rightarrow (\epsilon \cos^2 x + \Delta \cos x - 1, \Delta = 0) \times 1 \Rightarrow$$

$$1 \cos^2 x + 10 \cos x - 1 = 0 \Rightarrow \frac{-10 \pm \sqrt{100 + 4}}{2} \Rightarrow \frac{-10 \pm 11}{2} \Rightarrow$$

$$\cos x_1 = \frac{1}{2} = \frac{1}{2}, \cos x_2 = \frac{-11}{2} = -1, \text{ valid } x$$

$$\tan^2 x = \frac{1 - \cos^2 x}{\cos^2 x} = \frac{1 - \left(\frac{1}{2}\right)^2}{\left(\frac{1}{2}\right)^2} = \frac{1 - \frac{1}{4}}{\frac{1}{4}} = \frac{\frac{3}{4}}{\frac{1}{4}} = 3 \Rightarrow \boxed{3}$$

$$f(x+1) = x^2 - 2x + 9$$

$$f(\epsilon) \times f(-3)$$

-9

$$\left. \begin{aligned} x+1 &= \epsilon \Rightarrow x=1 \Rightarrow 1-2+9=8 \\ x+1 &=-3 \Rightarrow x=-4 \Rightarrow 16+12+9=37 \end{aligned} \right\} 8 \times 37 = \boxed{296}$$

$$\frac{\log \epsilon}{\sqrt{x^r - 1} + 1}$$

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

$$\sqrt{x^y - 1} + 1 \neq 0 \Rightarrow \sqrt{x^y - 1}$$

$$\# - 1 \Rightarrow \text{Can't be a prime} \Rightarrow R$$

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

(٢-الف) $\left(\left(\frac{1}{x}\right)^n - 4\right)(x^2 - \varepsilon^n) \geq 0 \rightarrow$

$\left(\frac{1}{x}\right)^n = 4 \rightarrow x = -\frac{1}{2}$ $x^2 = \varepsilon^n \rightarrow x = \frac{\varepsilon}{2}$

$\frac{-2}{+} \quad \frac{\varepsilon}{-} \quad +$ $\rightarrow D_f = (-\infty, -\frac{1}{2}] \cup [\frac{\varepsilon}{2}, +\infty)$