

19, 25 آفرین

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

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

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

$$\frac{0}{+} - \frac{1}{-} = -$$

$$x \in [\frac{1}{2}, 1) \cup (-\infty, 0]$$

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

$$= \frac{\frac{x-2x-2}{x(x+1)}}{\frac{2x+7+x-1}{(x-1)(x+2)}} = \frac{\frac{-x-2}{x(x+1)}}{\frac{3x+6}{(x-1)(x+2)}}$$

$$= \frac{(x-1)(x+2)(-x-2)}{x(x+1)(3x+6)}$$

$$x \neq \{0, -1, \frac{2}{3}, -2\}$$

2) انو

$$f(x) = \sqrt{(\frac{1}{x}-9)(32-5x)}$$

$$(\frac{1}{x}-9)(32-5x) \geq 0$$

$$\frac{-9}{+} \frac{32}{-} \frac{5}{+}$$

$$D_y = (-\infty, -2] \cup [2/\omega, +\infty)$$

$$\sqrt{x-1} + \sqrt{y+1} = 2$$

$$D_f = [1, 12]$$

$$\sqrt{y+1} = 2 - \sqrt{x-1} \rightarrow x-1 \geq 0 \rightarrow x \geq 1$$

۱)

$$f(x) = \frac{\log_2 |x^2 - x - 2|}{\sqrt{x^2 - 1} + 1}$$

$$x^2 - x - 2 \geq 0$$

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

$$\frac{-1}{2} \leq x \leq 2$$

(1, 2)

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

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

عبارت طبری و اصبت است!

۲)

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

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

$$x = -2 \rightarrow 3 - 2a - 2 \geq 0$$

$$a = \frac{1}{2}$$

$$-x^2 - \frac{1}{2}x + 2 \geq 0$$

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

$$a+b=1$$

$$\frac{-2}{-1} + \frac{2}{1} \rightarrow b = \frac{2}{1}$$

۳)

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

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

$$x \geq 1 \rightarrow g(x) = \sqrt{2x-2} \rightarrow x \geq 1 \quad (1)$$

$$x < 1 \rightarrow g(x) = \sqrt{2x+2} \rightarrow x \geq -1 \rightarrow -1 \leq x < 1 \quad (2)$$

$$(1) \cup (2) = -1 \leq x < 1 \rightarrow D_f = [-1, 1)$$

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

$$\sin \frac{\pi}{2} = \frac{\sqrt{2}}{2}$$

$$c. s. 2\pi = 1 \left\{ f\left(1 + \frac{\sqrt{2}}{2}\right) = 2\left(\frac{2 + \sqrt{2}}{2} - 2\sqrt{2}\right) \right.$$

(15)

$$= 2\left(\frac{2 - \sqrt{2}}{2}\right) = \frac{2 - \sqrt{2}}{1} \text{ فقط!}$$

$$2\left(1 + \frac{\sqrt{2}}{2}\right)^2 - 4\left(1 + \frac{\sqrt{2}}{2}\right) = 2\left(1 + \frac{\sqrt{2}}{2} + \sqrt{2}\right) - 4 - 2\sqrt{2} = -\frac{1}{2}$$

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

$$f(f(a)) = a$$

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

هنا، یزوار
فقط $a \neq 1$ باید
باشد

$$\{12 - \sqrt{1}\}$$

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

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

$$f(g(a)) = -4$$

$$f(\sqrt{a^2 - 1}) = -4$$

$$a^2 - 1 - 4\sqrt{a^2 - 1} = -4$$

$$a^2 - 1 - 4\sqrt{a^2 - 1} + 4 = 0$$

$$(\sqrt{a^2 - 1} - 2)^2 = 0$$

$$a^2 = 5$$

$$a = \pm \sqrt{5}$$

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$$f(x^2) = x^2 - \omega x + 4$$

$$x^2 + y = f \rightarrow f(x) =$$

$$x = -4 \rightarrow f(-4) = 4^2 \rightarrow f(-4) \times f(4) =$$

$$x = 1 \rightarrow f(1) = 4$$

$$x \cdot x \cdot 4 = 1 \cdot 1 \cdot 4$$

1.)

$$f(\sec x + \omega \csc x) = \tan^2 x$$

$$f(\sec \omega) = ?$$

$$\sec \omega \times \omega \csc \omega = \tan^2 \omega$$

$$\sec \omega \times \omega \csc \omega = \tan^2 \omega$$

$$\sec \omega \times \omega \csc \omega = \tan^2 \omega$$

$$\sec \omega = \frac{1}{\cos \omega}$$

$$\rightarrow 1 + \tan^2 \omega = \sec^2 \omega$$

$$\sec \omega = \frac{1}{\cos \omega}$$

$$\sin^2 \omega + \cos^2 \omega = 1$$

$$\sin^2 \omega = \frac{3}{4}$$

$$\rightarrow \tan^2 \omega = \frac{\sin^2 \omega}{\cos^2 \omega} = \frac{\frac{3}{4}}{\frac{1}{4}}$$

$$= 3$$

$$3- \log_{\epsilon} u^r - n - r \rightarrow u^r - n - r > 0 \rightarrow (n-r)(n+1) > 0 \quad \frac{-1}{+0-0+} \rightarrow n > r \leq n < -1 \quad I$$

$$\sqrt{n^r - 1} + 1 \rightarrow \text{هواره مثبت است} \rightarrow \sqrt{n^r - 1} \rightarrow n^r - 1 > 0 \rightarrow n \geq 1 \leq n \leq -1 \quad II$$

$$I, II \rightarrow n < -1, n > r \rightarrow D_f = (-\infty, -1) \cup (r, +\infty)$$

$$f(n) = r n^r - \epsilon n = r n^r - \epsilon n + r - r = r(n^r - \epsilon n + 1) - r = r(n-1)^r - r \quad -4$$

$$\sin \frac{\pi}{r} + \cos r\pi = \sqrt{\frac{r}{r}} + 1 \rightarrow f(\sqrt{\frac{r}{r}} + 1) = r(\sqrt{\frac{r}{r}} + 1 - 1)^r - r = r(\frac{r}{r}) - r = -\frac{1}{r}$$