

الف) $f(x) = \sqrt{\frac{x-1}{x} - \frac{x}{x-1}}$ $x \neq 0, 1$ $Df = (-\infty, 0) \cup [\frac{1}{2}, 1)$ ب) $f(x) = \frac{1}{x+1} - \frac{x}{x}$ $Df = \mathbb{R} - \{-2, -\frac{5}{2}, -1, 0, 1\}$	$\frac{x-1}{x} - \frac{x}{x-1} \geq 0$ $\frac{x^2-x+1-x^2}{x(x-1)} \geq 0$ $\frac{1-2x}{x(x-1)} \geq 0$ $x \neq 0, 1$ و $-2, -\frac{5}{2}, -1, 0, 1$ $\frac{x}{x+1} + \frac{1}{x+2} \neq 0$ $\frac{x^2+x+1}{(x+1)(x+2)} \neq 0$ $x \neq -1, -2$	1
الف) $f(x) = \sqrt{((\frac{1}{x})^2 - 9)(32 - x^2)}$ $Df = (-\infty, -2] \cup [\frac{4}{3}, \infty)$ ب) $\sqrt{x-1} + \sqrt{y+1} = 3 \rightarrow \sqrt{y+1} = 3 - \sqrt{x-1}$ $Df = I \cap II = [1, 12]$	$((\frac{1}{x})^2 - 9)(32 - x^2) \geq 0$ $(\frac{1}{x^2} - 9) \geq 0$ $32 - x^2 \geq 0$ $x \leq -2$ و $x \geq 2$ $x \leq \frac{4}{3}$ $x \geq 1$ $I: x \geq 1$ $II: x \leq 12$	2
$f(x) = \frac{\log_e(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1}$ $Df = (-\infty, -2) \cup (2, \infty)$	$x^2 - x - 2 > 0$ $(x-2)(x+1) > 0$ $x < -1$ و $x > 2$ $x^2 - 1 > 0$ $x > 1$ و $x < -1$ II $\sqrt{x^2 - 1} + 1 \neq 0$ $\sqrt{x^2 - 1} \neq -1$	3
$f(x) = \sqrt{x^2 + ax - x^2}$ $Df = [2, b]$ $a+b=?$ $\frac{1}{2} + \frac{3}{2} = 1$	$x^2 + ax - x^2 \geq 0$ $ax \geq 0$ $a \geq 0$ $x=b$ $(x^2 + (\frac{1}{2})xb - b^2 = 0) \times 2$ $-4 + b + 2b^2 = 0$ $b = \frac{3}{2}$	4
$f(x) = \begin{cases} x^2 - 2 & x \geq 1 \\ x^2 + 3 & x < 1 \end{cases}$ $g(x) = \sqrt{f(x) - x}$ $Dg = [-2, +\infty)$	$f(x) \geq x$ $x \geq 1 \rightarrow x^2 - 2 - x = x^2 - x - 2 \geq 0$ $x < 1 \rightarrow x^2 + 3 - x = x^2 - x + 3 \geq 0$	5

$$f(x) = \gamma_n \gamma_{-n}$$

$$f\left(\underbrace{\sin \frac{\pi}{\sqrt{y}}}_{\frac{1}{\sqrt{y}}} + \underbrace{\cos \sqrt{y}\pi}_1\right) = ? \Rightarrow f\left(\frac{\sqrt{y}}{y} + 1\right)$$

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

$$\sqrt{\frac{1}{12}} = \frac{1}{\sqrt{12}} = \frac{1}{2\sqrt{3}} = \frac{1}{2} \cdot \frac{1}{\sqrt{3}} = \frac{1}{2} \cdot \frac{\sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{1}{2} \cdot \frac{\sqrt{3}}{3} = \frac{\sqrt{3}}{6}$$

$$f(n) = \frac{n+1}{n-1}, \quad f(f(a)) = a.$$

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

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

تنها موردی برای $a \neq 0$
 $a \neq 1$

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

$$x^Y - Yx = -f$$

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

$$x^L - \epsilon x + \epsilon = 0$$

$$g(a) = r$$

$$\sqrt{r_{t-1}} = r.$$

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

$$x_{i-1} = r$$

$$x^{\ell-1} = r \quad x^{\ell} = \omega \quad x = \pm \sqrt{\omega}$$

$$P(x+y) = x^L \omega y$$

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

$$K + W = F \rightarrow K = 1$$

$$\frac{(1-\omega+y)}{r} \times \frac{(y+y\omega : +y)}{y} = \sqrt{1+y}$$

$$u + v = -4$$
$$u = -4$$

$$f (f \cos^2 \alpha + \omega \cos \alpha) = \tan^2 \alpha$$

$$f(\psi, \Delta) = ?$$

$$\sqrt{\cos^2 x} + \omega \underbrace{(\cos x)}_{+} = \sqrt{\omega} \omega$$

$$(r^k t^{r_1} + \omega t - r_1 \Delta = 0) \times r$$

$$At^2 + 10t - v = 0$$

$$t = \frac{-10 \pm \sqrt{10^2 - 4(1)(-1)}}{14} = \frac{-10 \pm \sqrt{41}}{14}$$

$$f(\psi, \omega) = \tanh \psi = (\sqrt{1 - \omega^2})^{\frac{1}{2}} = \sqrt{1 - \omega^2}$$

$$\frac{1}{\cos^2 x} - 1 = \tan^2 x$$

$$\cos x = \frac{-10 \pm 11}{14}$$

$$\cos \alpha = \frac{1}{\mu} \quad \& \quad \cos \alpha = \frac{-V}{R}$$