

① $\phi(n) = \sqrt{\frac{n-1}{n} - \frac{n}{n-1}} = \sqrt{\frac{(n-1)^2 - n^2}{n(n-1)}} \rightarrow$

$$c) f(x) = \frac{1}{x+1} - \frac{x}{x} \quad \text{I) } x \neq -1, 0, 1, -x$$

$$\frac{1}{x-1} + \frac{1}{x+1} \quad \text{II) } \frac{x - x^2 - x}{x}$$

$$\text{II)} \quad \frac{n - pm - r}{(m+1)(n)} = \frac{(m+r)(n-r)}{\frac{2(m+1)(n+r)}{2}} = \left\{ \cancel{0} - \frac{r}{2} - \frac{r}{2} - \frac{r}{2} \right\}$$

٧) انت $f(x) = \sqrt{\left(\left(\frac{1}{10}\right)^x - 9\right)(x^2 - 4)} \rightarrow \frac{+1}{-2} - \frac{b}{x, 0} +$ $Def: (-\infty, -2] \cup [2, +\infty)$

b) $\sqrt[n]{n-1} - \sqrt[n]{n+1} = \epsilon$ 1) $\frac{n}{n-1}$ 2) $\frac{n}{n+1} \rightarrow (n+1)^{\frac{n}{n+1}} = 1 + \frac{n}{n+1} \rightarrow 1 + \frac{n}{n+1}$
Def: $[1, 1+\epsilon]$

$$(w) \quad f(x) = \frac{\log(x^2 - x - 2)}{\sqrt{x-1} + 1} \rightarrow I) \quad x^2 - x - 2 > 0$$

$(x-2)(x+1)$

+ - +
-1 2

II) $x^2 - 1 \geq 0$ $\frac{x-1}{-1} + \frac{x+1}{1}$ III) $\sqrt{x^2 - 1} + 1 \neq 0 \rightarrow \sqrt{x^2 - 1} \neq -1$
 هذا لا يوجد

$$\underline{I \cap II \cap III} \rightarrow (-\infty, -1) \cup (1, \infty)$$

(۵) $y(x) = \sqrt{-x^2 + ax + 3}$ $\rightarrow$ $\frac{dy}{dx} = [-x + \frac{a}{2}]$ $\rightarrow$ $x = -2, y = 0 \rightarrow -4 - 2a + 3 = 0$
 $-2a = 1$ و $a = -\frac{1}{2}$
 عبارت درجه دوم عبارت
 زیر را می‌باشد از آنجایی
 که a متغیر است پس این دو
 عبارت می‌باشد است

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

$$-x = \frac{c}{a} \rightarrow -x = -2 \times b \rightarrow b = 1, b = 1, a = -\frac{1}{2} \quad \therefore \quad 1, b = 0, b = 1$$

(c) $g(u) = \sqrt{f(u) - u}$, $f(u) \begin{cases} u - r & u \geq 1 \\ ru + r & u < 1 \end{cases}$, $f(u) - u \geq 0 \rightarrow g(u) = \begin{cases} 0 & r(u-1) \geq 0 \\ \sqrt{ru + r - u} & \end{cases}$

Def: $[-r, \infty)$

④ $f(x) = 4x^2 - 9x \rightarrow 4x(x - \frac{9}{4}) \rightarrow f(\frac{\sqrt{w}}{4} + 1) = ? \quad \sqrt{w} + 4(\frac{\sqrt{w}}{4} - 1)$

$$y = \frac{3}{2} - \sqrt{\frac{3}{2}} + \sqrt{\frac{3}{2}} - 2 = \boxed{-\frac{1}{2}}$$

$$⑦ \quad f\left(\frac{a+1}{a-1}\right) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} = \frac{2a}{2} = a$$

به ازای هر مقدار
داده شده $a \neq 1$ چون
مخرج را تقریباً بشماره 0 نماند

$$⑧ \quad f(u) = u^2 - 2u \quad g(u) = \sqrt{u^2 - 1} \quad f(g(u)) = -2 \quad f(\square) = -2$$

$$u^2 - 2u + 2 = 0 \rightarrow \square = 2 \rightarrow g(u) = 2 \rightarrow u^2 - 1 = 2 \rightarrow u^2 = 3 \rightarrow u = \pm\sqrt{3}$$

$$⑨ \quad f\left(\frac{-u}{1+u}\right) = 3u + 30 + u = 44 \quad f\left(\frac{1}{1+u}\right) = 1 - 6 + u = 2$$

$$f(-u) \times f(u) = 44 \times 2 = 88$$

$$⑩ \quad f(2\cos^2 + 3\cos) = \tan^2 \rightarrow 2\cos^2 + 3\cos = \frac{1}{2} \rightarrow 2\cos^2 + 3\cos - \frac{1}{2} = 0$$

$$4t^2 + 6t - 1 = 0 \quad (t+2)(t-1) = 0 \rightarrow t = \frac{-3}{2} \rightarrow \cos u = -\frac{1}{2} \rightarrow \text{مقدار از 1- بزرگتر است مثلاً}$$

$$\cos u = \frac{1}{2} \quad \sin u = \frac{\sqrt{3}}{2} \quad t = \frac{1}{2} \rightarrow \cos u = \frac{1}{2}$$

$$\tan u = \frac{\sin}{\cos} \rightarrow \frac{\frac{\sqrt{3}}{\frac{1}{2}}}{\frac{1}{2}} = \sqrt{3} \rightarrow \tan^2 = 3$$