

زحرار حَقَّانی

1

$$u = \frac{1}{r}$$

$$+ \frac{0}{b} - \frac{1}{r} + \frac{1}{b} -$$

$$n \neq -1 \rightarrow \frac{1}{n+1} - \frac{1}{n} \rightarrow n \neq 0$$

$$n \neq 1 \quad \hookrightarrow \quad \hookrightarrow n \neq -1$$

$$\rightarrow n \neq -\frac{a}{r}$$

$$D_f = IR - \left\{ \nu, -\frac{\omega}{\varepsilon}, -1, 0, 1 \right\}$$

γ

$$\lambda = \frac{\omega}{\gamma}$$

$$\frac{-x \quad \frac{2}{x}}{+ \phi - \phi +}$$

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

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

$$\textcircled{1} \begin{array}{l} x-1 > 0 \\ x > 1 \end{array}$$

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

$$r - \sqrt{x-1} > 0$$

$$\sqrt{x-1} \leq r$$

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

$$x \leq r^2 + 1$$

$$\textcircled{1} \cap \textcircled{2} \rightarrow D_f = [1, r^2 + 1]$$

$$f(x) = \frac{\log_e (x^2 - x - r)}{\sqrt{x^2 - 1} + 1} \rightarrow x^2 - x - r > 0 \quad \textcircled{3}$$

$$(x+1)(x-r) > 0$$

$$x = -1 \quad x = r$$

$$\begin{array}{c} -1 \quad r \\ + \quad - \quad + \end{array}$$

$$(-\infty, -1) \cup (r, +\infty)$$

$$\textcircled{1} \quad x^2 - 1 > 0$$

$$x^2 > 1 \rightarrow \begin{cases} x > 1 \\ x < -1 \end{cases}$$

$$(-\infty, -1) \cup [1, +\infty)$$

$$\textcircled{2} \sqrt{x^2 - 1} \neq -1 \rightarrow \mathbb{R}$$

همیشه برقراره

$$\textcircled{1} \cap \textcircled{2} \cap \textcircled{3} \rightarrow (-\infty, -1) \cup (r, +\infty)$$

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

$$[-r, b]$$

$$a+b =$$

$$\frac{r}{r} - \frac{1}{r} = \frac{b}{r}$$

مساوی

$$\begin{aligned} &-(x+r)(x-b) \\ &\rightarrow -x^2 + (b-r)x + rb \end{aligned}$$

$$-x^2 + (b-r)x + rb = r + ax - x^2$$

$$rb = r \rightarrow b = \frac{r}{r}$$

$$a = b - r \rightarrow \frac{r}{r} - r \Rightarrow a = \frac{-1}{r}$$

$$g(x) = \sqrt{f(x) - x}, 0 \rightarrow \textcircled{1} \text{ CMC: } \begin{cases} x - 4 - x > 0 \\ x - 4 > 0 \end{cases}$$

$$\textcircled{2} \text{ CMC: } \begin{cases} 4x + 3 - x > 0 \\ x < 1 \end{cases} \quad \begin{cases} x + 3 > 0 \\ x > -3 \end{cases} \quad \begin{cases} x > -3 \\ x > -1 \end{cases} \quad \begin{cases} x > 0 \\ x > 1 \end{cases}$$

$[-3, 1)$ $\xleftarrow{x < 1 \text{ bound}}$ $[-1, +\infty)$

$$\Rightarrow D_f = [-3, +\infty)$$

$$f\left(\sin \frac{\pi}{3} + \cos 4\pi\right) = f \quad f(x) = 4x^4 - 8x \quad \textcircled{3}$$

$$4\left(\sin \frac{\pi}{3} + \cos 4\pi\right)^4 - 8\left(\sin \frac{\pi}{3} + \cos 4\pi\right) =$$

$\swarrow \quad \searrow$
 $\frac{\sqrt{3}}{2} \quad 1$

$$= 4\left(\frac{\sqrt{3}}{2} + 1\right)^4 - 8\left(\frac{\sqrt{3}}{2} + 1\right) = \frac{4}{2} + 4 + 4\sqrt{3} - 4\sqrt{3} - 8 = \frac{4}{2} - 4 = \frac{-1}{2}$$

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

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

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

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

بنابر این رابطه برای هر a به جز مقاری که مخرج صفر شود برقرار است

$$a \neq 1 \quad D_f = \mathbb{R} - \{1\}$$

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

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

$$\sqrt{a^2 - 1} = t \quad \begin{cases} a^2 - 1 - \varepsilon \sqrt{a^2 - 1} = -\varepsilon \\ t^2 - \varepsilon t + \varepsilon = 0 \end{cases}$$

$$(t - \varepsilon)^2 = 0$$

$$\hookrightarrow t = \varepsilon \rightarrow \sqrt{a^2 - 1} = \varepsilon$$

$$a^2 - 1 = \varepsilon$$

$$\boxed{a = \pm \sqrt{a^2 - 1} \quad a^2 = a}$$

$$f(\varepsilon) \times f(-\varepsilon) = 1 \quad f(x + \varepsilon) = x^2 - ax + \varepsilon \quad 4$$

$$x + \varepsilon = \varepsilon \rightarrow x = 1 \rightsquigarrow f(\varepsilon) = (1)^2 - a(1) + \varepsilon$$

$$= 1 - a + \varepsilon$$

$$\boxed{f(\varepsilon) = \varepsilon}$$

$$x + \varepsilon = -\varepsilon \rightarrow x = -\varepsilon \rightsquigarrow f(-\varepsilon) = (-\varepsilon)^2 - a(-\varepsilon) + \varepsilon$$

$$= \varepsilon^2 + \varepsilon a + \varepsilon = \varepsilon^2$$

$$\boxed{f(-\varepsilon) = \varepsilon^2}$$

$$f(\varepsilon) \times f(-\varepsilon) = \varepsilon \times \varepsilon^2 = \varepsilon^3$$

$$f(v/a) = \beta \quad f(\epsilon \cos^2 x + \omega \cos x) = \tan^2 x \quad 10$$

$$\epsilon \cos^2 x + \omega \cos x = \mu_1 \omega$$

$$\cos x = t$$

$$\text{or } \epsilon t^2 + \omega t - \mu_1 \omega = 0$$

$$1t^2 + 10t - 10 = 0$$

$$(t - \frac{\epsilon}{1})(t + \frac{10}{1}) = 0 \rightarrow (t - \frac{1}{4})(t + \frac{10}{\epsilon}) = 0$$

$$t = \frac{1}{4}$$

$$t = -\frac{10}{\epsilon}$$

بجواب چون $1 \leq \cos x \leq 1$ و $0 \leq \cos x \leq 1$ پس $-\frac{10}{\epsilon}$ را رد می‌کنیم

$$t = \frac{1}{4} \rightarrow \cos x = \frac{1}{4}$$

$$\tan^2 x = \frac{\sin^2 x}{\cos^2 x}$$

$$\sin^2 x = 1 - \cos^2 x$$

$$1 - \frac{1}{16} = \frac{15}{16}$$

$$\rightarrow \tan^2 x = \frac{\frac{15}{16}}{\frac{1}{16}} = 15$$

جواب آخر