

الف) $y = \sqrt{\frac{n-1}{n} - \frac{1}{n-1}} = y = \sqrt{\frac{(n-1)^2 - n^2}{n(n-1)}} = \sqrt{\frac{-2n+1}{n(n-1)}}$

$D = (-\infty, 0) \cup [\frac{1}{4}, 1)$

ب) $y = \frac{1}{n+1} - \frac{n}{n-1} = \frac{1}{n+1} - \frac{n}{n-1}$

$D = \mathbb{R} - \{-1, 0, 1\}$

ج) $f(n) = \sqrt{\left(\left(\frac{1}{p}\right)^n - q\right) \left(\frac{1}{p} - n^p\right)}$

$D = (-\infty, 1] \cup \left[\frac{1}{p}, 1\right)$

د) $\sqrt{n-1} + \sqrt{y+1} = w$

$D = [1, 10]$

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

$x^2 - n^2 > 0$

$(x-n)(x+n) > 0$

$x > n$ و $x < -n$

$n > 1$

$\Rightarrow \sqrt{x^2-1} \neq -1$

هوا به هوا

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

ه) $g = \sqrt{-n^2 + an + w}$

$D = [-1, b]$

$a = -\frac{1}{p}$

$b + a = \frac{w}{n} - \frac{1}{p} = 1$

$b = \frac{w}{p}$

$f(n) = \begin{cases} \frac{1}{p}n - \frac{1}{p} & n \geq 1 \\ \frac{1}{p}n + \frac{1}{p} & n < 1 \end{cases}$

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

$D = [1, +\infty) \cup (-\infty, -1] = D$

$f(n) - n \geq 0$

$\frac{1}{p}n - \frac{1}{p} - n \geq 0 \Rightarrow \frac{1}{p}n \geq \frac{1}{p} \Rightarrow n \geq 1$

$\frac{1}{p}n + \frac{1}{p} - n \geq 0 \Rightarrow \frac{1}{p}n \geq -\frac{1}{p} \Rightarrow n \geq -1$

مشتق (Derivative) را به ترتیب! که نقای مصداق است در این نوشتار:

$$f(n) = n^p - p n$$

$$f\left(\sin \frac{\pi}{\sqrt{p}+1} + \cos \frac{\pi}{\sqrt{p}+1}\right) = p\left(\frac{1+\sqrt{p}}{p}\right)^p - p\left(\frac{1+\sqrt{p}}{p}\right)$$

$$f\left(\frac{1+\sqrt{p}}{p}\right) = p\left(\frac{1+\sqrt{p}}{p}\right)^p - p\left(\frac{1+\sqrt{p}}{p}\right) = \frac{p}{p} + \frac{p\sqrt{p}}{p} - p - \frac{p\sqrt{p}}{p} = -\frac{1}{p}$$

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

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

$$a \in \mathbb{R} \setminus \{1\}$$

$$a = \left\{x \mid x \in \mathbb{R}, x \neq 1\right\}$$

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

$$f(n) = n^p - p n \quad g(n) = \sqrt{n^p - 1}$$

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

$$\Rightarrow g(a) = n \Rightarrow \sqrt{a^p - 1} = n$$

$$\Rightarrow a = \pm \sqrt[n]{a^p - 1}$$

$$\begin{aligned} n^p - p n &= a \\ n^p - p n + p &= a + p \\ \Rightarrow n &= p \end{aligned}$$

$$f(n+p) = n^p - a n + p$$

$$f(-p) = p^p + p + p = p^p$$

$$n+p = -p \Rightarrow n = -p$$

$$f(p) = 1 - a + p = p$$

$$n+p = p \Rightarrow n = 0$$

$$f(p) \times f(-p) = p^p \times p^p = (p^p)^2$$

$$f(p \cos^n \theta + p \cos \theta) = \tan^n \theta$$

$$f(p, a) = p - a$$

$$\Rightarrow \tan^n \theta + 1 = \frac{1}{\left(\frac{1}{p}\right)^p} = p \Rightarrow \tan^n \theta = p - 1$$

$$p \cos^n \theta + a \cos \theta = \frac{p}{a}$$

$$p \cos^n \theta + a \cos \theta - \frac{p}{a} = 0$$

$$\cos^n \theta + a \cos \theta - \frac{p}{a} = 0$$

$$\begin{cases} \cos \theta = -\frac{1}{p} \\ \cos \theta = \frac{1}{p} \end{cases}$$

$$\begin{cases} \cos \theta = \frac{1}{p} \\ \cos \theta = -\frac{1}{p} \end{cases}$$

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

$$\sqrt{n^r-1} + 1 \rightarrow \sqrt{n^r-1} \rightarrow n^r-1 \geq 0 \rightarrow n \geq 1 \leq n \leq -1 \quad II$$

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

$$f(n) = r n^r - 2n = r n^r - 2n + r - r = r(n^r - 2n + 1) - r = r(n-1)^r - r \quad -4$$

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