

الف) $\frac{n-1}{n} - \frac{n}{n-1} > 0 \rightarrow \frac{(n-1)^2 - n^2}{n(n-1)} > 0$ (۱)

صورت $n^2 - 2n + 1 - n^2 = -2n + 1 \rightarrow \frac{1-2n}{n(n-1)} > 0 \rightarrow 1 = 2n \rightarrow n = 1/2$
 $n=0$ $n=1$
 $\frac{0}{+} \frac{1/2}{-} \frac{1}{+}$
 $\rightarrow (-\infty, 0) \cup [1/2, 1)$

ب) $\frac{2}{n-1} + \frac{1}{n+2} \neq 0$ II $\frac{1}{n+1} - \frac{2}{n}$
 I $n \neq 1$ $n \neq -2$ $n \neq -1$ $n \neq 0$

III $\frac{2(n+2) + n - 1}{(n-1)(n+2)} \neq 0 \rightarrow 3n+3 \neq 0 \rightarrow n \neq -1$
 $\rightarrow R - \{-2, -1, 0, 1\}$

الف) $((1/4)^n - 9)(32 - 4^n) > 0$ (۲)
 $32 - 4^n = 0 \rightarrow 32 = 4^n \rightarrow 2^5 = 2^{2n} \rightarrow n = 5/2$

$(1/4)^n - 9 = 0 \rightarrow (1/4)^n = 9 \rightarrow n = -2$ $n = 5/2$
 $\frac{-2}{+} \frac{5/2}{-}$
 $\rightarrow (-\infty, -2] \cup [5/2, +\infty)$

ب) $n-1 > 0 \rightarrow n > 1$ I $n > 1$ $n > -1$
 $y+1 > 0 \rightarrow y > -1$ $n \rightarrow [1, 2]$

$\rightarrow -2\sqrt{n-1} + 3 = \sqrt{y+1}$

$\rightarrow 3 - \sqrt{n-1} > 0 \rightarrow 3 > \sqrt{n-1} \rightarrow n-1 < 9 \rightarrow n < 10$ I
 $n < 10$

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$$n^2 - n - r > 0 \rightarrow (n - r)(n + 1) > 0$$

$$n^2 - 1 > 0 \rightarrow n > 1 \rightarrow n < -1$$

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

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

$$[r, b]$$

$$n^2 - 1 = 0 \rightarrow n = 1 \rightarrow n = -1$$

$$a = -1$$

$$b = 1$$

$$1 = 1 - 1 = 0$$

$$(a)$$

$$n > 1 \rightarrow n - 1 - n = -1$$

$$n > 1$$

$$(b)$$

$$n < 1 \rightarrow n + 1 - n = 1$$

$$n = 0$$

$$f(x) = [x + \infty]$$

$$f(x) = [x + 1] = [x] + 1$$

$$f(x) = [x + 1] = [x] + 1$$

$$f(x) = [x + 1] = [x] + 1$$

$$(-1) = -1$$

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

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

(✓)

$$\Rightarrow \frac{a+1+a-1}{a-1} = \frac{2a}{a-1}$$

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

$$= a+1-a+1$$

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

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$$a-1 \neq 0 \rightarrow a \neq 1$$

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

$$+ \frac{a-1}{2}$$

$$= (a)$$

$$\rightarrow f(f(a)) = a$$

$$D \rightarrow \mathbb{R} \setminus \{1\}$$

(✓)

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

(1) 10

$$g(a) = t \rightarrow f(t) = -f \rightarrow t - f + t = -f$$

$$t - f + t + f = 0$$

$$2g(a) = 2t$$

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

$$(t - f)^2 = 0 \rightarrow t = f$$

$$a^2 - 1 = f \rightarrow a^2 = 1 + f \rightarrow a = \pm \sqrt{1+f}$$

(✓)

$$a + f = 0 \rightarrow a = -f \rightarrow f(f) = 1 - a + f = f$$

(9)

$$a + f = -f \rightarrow a = -2f \rightarrow f(-2f) = 1 + 4f + f = 5f$$

$$5f \times f = 1 \Rightarrow f = \pm \frac{1}{\sqrt{5}}$$

(✓)

$$f \cos n + a \cos n = \frac{1}{\sqrt{5}}$$

(1)

$$\cos n = t$$

$$\rightarrow f + t + a + t = \frac{1}{\sqrt{5}}$$

$$1 + f + a + t = \frac{1}{\sqrt{5}}$$

$$a = 1 \rightarrow f(1) = \frac{1}{\sqrt{5}} \rightarrow f = \frac{1}{\sqrt{5}}$$

(✓)

MAHAN

$$\rightarrow n = \frac{-1 \pm i\sqrt{14}}{14}$$

$$\rightarrow \sqrt{14} \times f = 1 \rightarrow \sqrt{14} \times \frac{1}{\sqrt{5}} = 1 \rightarrow \sqrt{14} = \sqrt{5}$$

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$$f(r, a) = \tan(n)^r \rightarrow \frac{1 - \cos n^r}{\cos n^r} \quad \cos n = 1/a$$

$$\Rightarrow \frac{1 - \cancel{\cos n}^r}{1/a^r} \quad 1/r = r/r \times r = (r) \rightarrow \tan n^r$$

→ f(r, a)

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😊

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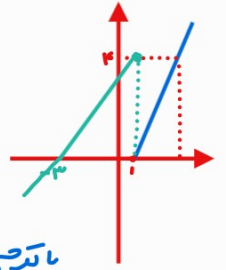
$$f(n) - n = \begin{cases} n^2 - 2 - n & n \geq 1 \\ n + 3 - n & n < 1 \end{cases} = \begin{cases} n^2 - 2 & n \geq 1 \\ n + 3 & n < 1 \end{cases}$$

-5

$$f(n) - n \geq 0 \rightarrow \begin{cases} n^2 - 2 \geq 0 \rightarrow n \geq 1 \checkmark \\ n + 3 \geq 0 \xrightarrow{n < 1} -3 \leq n < 1 \checkmark \end{cases}$$

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

باید به پس نیز مشخص است!



$$f(n) = n^2 - 2n = n^2 - 2n + 2 - 2 = (n^2 - 2n + 1) - 2 = (n-1)^2 - 2$$

-4

$$\sin \frac{\pi}{\varepsilon} + \cos 2\pi = \sqrt{\frac{\pi}{\varepsilon}} + 1 \rightarrow f\left(\sqrt{\frac{\pi}{\varepsilon}} + 1\right) = \left(\sqrt{\frac{\pi}{\varepsilon}} + 1 - 1\right)^2 - 2 = \left(\sqrt{\frac{\pi}{\varepsilon}}\right)^2 - 2 = -\frac{1}{\varepsilon}$$