

$$\text{الف) } \frac{x-1}{x} - \frac{x}{x-1} \geq 0 \rightarrow \frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{x^2 - 2x + 1 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{-2x + 1}{x(x-1)} \geq 0$$

$$\Rightarrow D_f = (-\infty, 0) \cup \left[\frac{1}{2}, 1\right)$$

$$\text{ب) } 1) x+1 \neq 0 \Rightarrow x \neq -1$$

$$2) x \neq 0$$

$$3) x-1 \neq 0 \Rightarrow x \neq 1$$

$$4) x+2 \neq 0 \Rightarrow x \neq -2$$

$$\text{و) } \frac{x^2}{x-1} \neq \frac{-1}{x+2} \Rightarrow x^2 + 2 \neq -x + 1 \rightarrow x^2 + x - 1 \neq 0 \Rightarrow x \neq \frac{-1 \pm \sqrt{5}}{2}$$

$$D_f = \mathbb{R} - \left\{-1, -\frac{1}{2}, 1, 0, \frac{-1 \pm \sqrt{5}}{2}\right\}$$

$$\text{الف) } \left(\left(\frac{1}{x}\right)^x - 9\right) \cdot (2x - 2x) \geq 0 \rightarrow$$

$$x = -2 \rightarrow 2x - 2x = 0 \rightarrow 2^x = 2^x \Rightarrow x = 2, 0$$

$$\frac{-2}{+} \frac{2, 0}{+} \Rightarrow D_f = \mathbb{R} - (-2, 2, 0)$$

$$\text{ب) } 1) x-1 > 0 \rightarrow x > 1$$

$$2) \sqrt{x+1} = 3 - \sqrt{x-1} \Rightarrow 3 - \sqrt{x-1} \geq 0 \rightarrow x-1 \leq 1 \rightarrow x \leq 2$$

$$1) \cap 2) \Rightarrow D_f = [1, 2]$$

$$1) \log_f(x^2 - x - 2) \rightarrow f \neq 1, f > 0, x^2 - x - 2 > 0 \rightarrow (x+2)(x-1) > 0 \rightarrow \frac{-1}{+} \frac{2}{-} \Rightarrow \mathbb{R} - [-1, 2]$$

$$2) x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1, x \leq -1$$

$$3) \sqrt{x+1} \neq -1 \rightarrow \checkmark$$

$$1) \cap 2) \cap 3) \rightarrow D_f = \mathbb{R} - [-1, 2]$$

وقتی سعی زیر منجر به است و باز به شکل  $[a, b]$  است، و  $a < 0$ ، در نتیجه سعی به شکل زیر است

$$x = -2 \Rightarrow 3 - 2a - 4 = 0 \Rightarrow -2a - 1 = 0 \rightarrow a = -\frac{1}{2}$$



$$x = b \Rightarrow 3 + \left(-\frac{1}{2}\right)b - b^2 = 0 \rightarrow b^2 + \frac{b}{2} - 3 = 0 \rightarrow 2b^2 + b - 6 = 0$$

$$ac \rightarrow b^2 + b - 12 = 0 \rightarrow (b+4)(b-3) = 0 \rightarrow b = -4, 3$$

$$a+b=1$$

$$f(x) \cdot x \geq 0 \rightarrow \begin{cases} x \geq 1 \rightarrow 2x - 2 - x \geq 0 \rightarrow x - 2 \geq 0 \rightarrow x \geq 2 \rightarrow [2, +\infty) \\ x < 1 \rightarrow 2x + 3 - x \geq 0 \rightarrow x + 3 \geq 0 \rightarrow x \geq -3 \rightarrow [-3, 1) \end{cases}$$

$$U \rightarrow [-3, 1) \cup [2, +\infty) = [-3, +\infty) = D_g$$

$$\left. \begin{aligned} \sin \pi/r &= \sin \pi = \sqrt{r}/r \\ \cos 2\pi &= \cos 2\pi = 1 \end{aligned} \right\} f(\sin \pi/r + \cos 2\pi) = f(\sqrt{r}/r)$$

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$$\rightarrow f(x) = rx^r - f_r \xrightarrow{x=\sqrt{r}/r} f(\sqrt{r}/r) = r(\sqrt{r}/r)^r - f_r = r \cdot \frac{r^{r/2}}{r^r} - f_r = \frac{r^{1+r/2}}{r^r} - f_r = \frac{r^{1+r/2-r}}{r^r} - f_r = \frac{r^{1-r/2}}{r^r} - f_r$$

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

$$r + \frac{r^2}{2} + r\sqrt{r} - f - r\sqrt{r} = -15$$

$$r(1 + \frac{\sqrt{r}}{r})^r - f(1 + \frac{\sqrt{r}}{r}) = -\frac{1}{r} \quad \text{دقت کن}$$

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

$$\rightarrow \frac{\frac{ra}{a-1}}{\frac{r}{a-1}} = a \rightarrow \frac{ra}{a-1} = ar \Rightarrow a \in \mathbb{R} - \{1\}$$

$$g(a) = \sqrt{a^r - 1} \rightarrow f(g(a)) = -f \rightarrow f(\sqrt{a^r - 1}) = -f \rightarrow (\sqrt{a^r - 1})^r - r\sqrt{a^r - 1} = -f$$

$$a^r - 1 - f\sqrt{a^r - 1} + f = 0 \xrightarrow{t=\sqrt{a^r - 1}} t^r - ft + f = 0 \rightarrow (t-r)^r = 0 \Rightarrow t=r$$

$$t=r \rightarrow \sqrt{a^r - 1} = r \rightarrow a^r - 1 = r^2 \rightarrow a^r = r^2 + 1 \Rightarrow a = \pm \sqrt[r]{r^2 + 1}$$

$$f(r) = f(x+r) \Rightarrow x=1 \rightarrow f(r) = (1)^r \cdot a(1) + b = r$$

$$f(-r) = f(x+r) \Rightarrow x=-1 \rightarrow f(-r) = (-1)^r \cdot a(-1) + b = -r$$

$$f(r) \times f(-r) = 1 \times f$$

محل به روش درس باید آخر جواب هارا بنویس (4) قیاس کن!

$$f(r, a) = f(f \cos^r x + a \cos x) \rightarrow f \cos^r x + a \cos x - r, a = 0 \xrightarrow{t=\cos x} f t^r + a t - r, a = 0$$

$$\xrightarrow{ac} t^r + a t - 1f = 0 \rightarrow (t+r)(t-r) = 0 \rightarrow \cos x = r, -r \rightarrow \frac{-\frac{r}{2} \times \frac{r}{2}}{\frac{r}{2}} = \frac{1}{r}$$

$$f\left(\frac{r}{a}\right) = f(f \cos^r x + a \cos x) \rightarrow f \cos^r x + a \cos x - \frac{r}{a} = 0 \xrightarrow{t=\cos x} f t^r + a t - \frac{r}{a} = 0 \rightarrow \cos x = \frac{r}{a} \Rightarrow f\left(\frac{r}{a}\right) = \frac{1 - \frac{r}{a}}{\frac{r}{a}} = \frac{a-r}{r}$$

$$r \cdot t^r + r a t - r = 0 \rightarrow (t+1)(at+r) = 0 \rightarrow \cos x = -\frac{r}{a} \Rightarrow f\left(-\frac{r}{a}\right) = \frac{1 - \frac{-r}{a}}{\frac{-r}{a}} = \frac{1 + \frac{r}{a}}{\frac{-r}{a}} = -\frac{a+r}{r}$$

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$$C_{sn} = \frac{-\Delta \pm \sqrt{\Delta^2 + 4}}{\lambda} \quad \rightarrow C_{sn} = \frac{-\Delta + 9}{\lambda} = \frac{1}{r}$$

$$\hookrightarrow C_{sn} = \frac{-\Delta - 9}{\lambda} = -\frac{v}{\varepsilon} \times C_{sn} \geq -$$

$\vec{r} = r \cdot \vec{e}_r : \cos \frac{\pi}{2} = \frac{1}{r} \quad , \quad \cos \frac{\pi}{2} = \frac{1}{r} \quad \rightarrow \quad f(r) = r$   
 $\downarrow \quad \quad \quad \downarrow$   
 $\cos \frac{\pi}{2} = (\sqrt{r})^2 = r \quad \quad \cos \frac{\pi}{2} = (-\sqrt{r})^2 = r$