

$$\sin \frac{\alpha}{r} \rightarrow r \left(\frac{\sqrt{r}}{r} \right) \left(-\frac{r + \sqrt{r}}{r} \right) = -\frac{r + r\sqrt{r}}{r} \quad f(r) = rm^r - r\alpha \quad (6)$$

$$\cos 2\alpha \rightarrow r(1)(1-r) = -r$$

$$-\frac{r + r\sqrt{r}}{r} - \frac{r}{r} \rightarrow -\frac{1 + r\sqrt{r}}{r}$$

$$f(a+b) \neq f(a) + f(b)$$

$$f(x) = x^r \text{ انجمن}$$

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

$$f(r) = 2$$

$$f(r) = a \rightarrow f(r) + f(r) = 1$$

$$f(r+r) = f(r) = 20 \quad \times \times$$

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

$$Df = \mathbb{R} - \{1\}$$

$$a \neq 1$$

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

$$f(g(a)) \rightarrow \sqrt{(a^r - 1)^r} - r\sqrt{a^r - 1} + r s_0 \rightarrow a^r - 1 - r\sqrt{a^r - 1} + r s_0$$

$$\sqrt{a^r - 1} = t \rightarrow t^r - r't + r s_0 \rightarrow (t - r)^r s_0$$

$$(\sqrt{a^r - 1} - r)^r \Rightarrow a \leq \sqrt{a}$$

$$n + r \leq r \quad n \leq 1$$

$$f(r) \leq 1 - a + r \leq r$$

$$n + r \leq -r \quad n \leq -4$$

$$f(-r) \leq r^4 + r_0 + r \leq r^2$$

$$\left. \begin{array}{l} n + r \leq r \quad n \leq 1 \\ f(r) \leq 1 - a + r \leq r \\ n + r \leq -r \quad n \leq -4 \\ f(-r) \leq r^4 + r_0 + r \leq r^2 \end{array} \right\} \quad \text{all } x, y \leq 1 \text{ or } x$$

$$r \cos^2 m + 2 \cos m = r/d$$

$$\cos m (r \cos m + 2) = r/d \quad \rightarrow \frac{r}{r}$$

$$f(r) = \frac{r}{r}$$

$$rt^r + 2t - \frac{r}{r} s_0 \quad t \leq \frac{1}{r} \rightarrow \cos m \leq \frac{1}{r} \rightarrow n \leq 40$$

$$f(r/d) = \tan^r 40^\circ$$

$$\tan^r 40^\circ \leq 3$$

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نیمه فانی کلاس

(1)

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

$Df \Rightarrow x(x-1) \Rightarrow 0, 1 \neq x$

$(x-1)^2 - x^2 \geq 0$
 $x^2 - 2x + 1 - x^2 \geq 0 \Rightarrow -2x + 1 \geq 0$

$\begin{matrix} 0 & \frac{1}{2} & 1 \\ + & | - \phi & + | - \\ 0 & & 1 \end{matrix}$ $(-\infty, 0) \cup [\frac{1}{2}, 1) \subset Df$

1.15

$\Rightarrow \frac{x-2x-2}{(x+1)x} \cdot \frac{3(x+2)+(x-1)}{(x-1)(x+2)} \rightarrow 4x+5 \neq 0 \rightarrow x \neq -\frac{5}{4}$

$Df \supset \mathbb{R} - \{0, -1, -2, 1\} \cup (-\frac{5}{4}, \infty)$

$\begin{cases} x+1 \neq 0 & x \neq -1 \\ x \neq 0 \\ x+2 \neq 0 & x \neq -2 \\ x \neq 1 \end{cases}$

الف) $(\frac{1}{x})^n - 9 \geq 0 \Rightarrow (\frac{1}{x})^n \geq 9 \rightarrow (\frac{1}{x})^{-2} \rightarrow x \geq -2$

1.18

$3x - 4 \geq 0 \Rightarrow 3x \geq 4 \Rightarrow x \geq \frac{4}{3}$

$3x \geq 4 \rightarrow 3 \geq \frac{4}{x} \Rightarrow \frac{4}{x} \geq 3 \Rightarrow x \leq \frac{4}{3}$

$Df \subset [-2, \frac{4}{3}]$

$Df \subset (-\infty, -2] \cup [\frac{4}{3}, +\infty)$

1.18

ب) $\sqrt{x-1} \geq 0 \Rightarrow x \geq 1 \Rightarrow Df \subset [1, +\infty)$

$\sqrt{y+1} = 3 - \sqrt{x-1} \rightarrow \sqrt{x-1} \leq 3 \rightarrow x-1 \leq 9 \rightarrow x \leq 10$

$x^2 - x - 2 > 0 \Rightarrow (x+1)(x-2) > 0 \Rightarrow x < -1 \text{ or } x > 2$

$Df \subset [1, 2] \cup (10, +\infty)$

خرج غیر قابل فسر است و زیر را مثال هم در صورت $x \neq 0$ معنی ندارد

$b, -2 \leq \frac{1}{x} \rightarrow 3 - 2x - 4 \leq 0 \Rightarrow x \leq -\frac{1}{2}$

$-x^2 - \frac{1}{x} + 3 \geq 0 \rightarrow \frac{1}{x} + \sqrt{\frac{1}{x} - 4(3)(-1)} \rightarrow x_1 = \frac{1}{x} + \frac{\sqrt{1+12}}{-2} \leq -2$

$x_2 = \frac{1}{x} - \frac{\sqrt{1+12}}{-2} \Rightarrow b$

$f(x) - x \geq 0 \Rightarrow \begin{cases} 3x(-x) - 2 & x \geq 1 \\ 2x(-x) + 3 & -2 \leq x < 1 \end{cases}$

$Df \subset [-2, +\infty)$

1.18

تمام ریشه های مخرج ها نباید در دامنه باشند !
 ۱) - ب $x+1 \neq 0 \rightarrow x \neq -1$ / $x \neq 0$ / $x-1 \neq 0 \rightarrow x \neq 1$

$$x+2 \neq 0 \rightarrow x \neq -2 \quad ; \quad \frac{3}{x-1} + \frac{1}{x+2} \neq 0 \rightarrow \frac{3x+4+x-1}{(x-1)(x+2)} \neq 0 \rightarrow 4x+3 \neq 0 \rightarrow x \neq -\frac{3}{4}$$

$$D_f = \mathbb{R} - \left\{ -1, 0, 1, -2, -\frac{3}{4} \right\}$$

۲) - الف $\left(\left(\frac{1}{x} \right)^n - 9 \right) (32 - x^n) \geq 0 \rightarrow \frac{-2 \quad \frac{5}{2}}{+ \quad - \quad +} \rightarrow D_f = (-\infty, -2] \cup \left[\frac{5}{2}, +\infty \right)$

$\downarrow \quad \quad \downarrow$
 $\left(\frac{1}{x} \right)^n = 9 \rightarrow x = -2 \quad 32 = x^n \rightarrow x = \frac{5}{2}$

۲) - ب $\sqrt{x-1} + \sqrt{y+1} = 3$ و $\underbrace{\sqrt{y+1}}_{\text{همواره مثبت}} = \underbrace{3 - \sqrt{x-1}}_{\text{همواره مثبت!}} \rightarrow 3 - \sqrt{x-1} \geq 0 \rightarrow \sqrt{x-1} \leq 3 \rightarrow x \leq 10$

$\downarrow$
 $x-1 \geq 0 \rightarrow x \geq 1 \quad \text{I}$

I, II $\rightarrow 1 \leq x \leq 10 \rightarrow D_f = [1, 10]$

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

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