

الف) $f(x) = \sqrt{\frac{(x+1)^2 - x^2}{x(x-1)}} \sim \frac{1-x}{x(x-1)} \geq 0$ (1)

$$\begin{array}{c|ccc} & 0 & 1 & \\ \hline & + & - & + \\ \hline & 0 & 1 & \end{array} \sim D_f = (-\infty, 0) \cup [1, \infty)$$
 (2)

ب) $\frac{1}{x+1} - \frac{2}{x} = \frac{x-2(x+1)}{x(x+1)} = \frac{-x-2}{x(x+1)}$

$\frac{3}{x-1} + \frac{1}{x+2} = \frac{(x+5)}{(x-1)(x+2)} \Rightarrow D_f = \mathbb{R} - \left\{ -2, -\frac{5}{2}, 1, 0, 1 \right\}$

$x+5 \neq 0, x-1 \neq 0, x+2 \neq 0$

الف) $\left(\frac{1}{k}\right)^n - 9(32 - 5^n) \geq 0$

$\left(\frac{1}{k}\right)^n = 9 \Rightarrow n = -2$
 $32 = 5^n \rightarrow n = \frac{5}{\log 5}$

$D_f = (-\infty, -2] \cup \left[\frac{5}{\log 5}, \infty\right)$

ب) $\sqrt{y+1} \geq 2 - \sqrt{x-1} \geq 3 + \sqrt{x-1} \geq 0$ (1)

$\sqrt{x-1} \leq 3 \Rightarrow x-1 \leq 9 \Rightarrow x \leq 10$

$D_f = [1, 10]$

$$(n-1)(n+1) > 0 \sim \frac{-1 \pm \sqrt{1+4}}{2}$$

$$(1) \sim \frac{n^2-1}{(n-1)(n+1)} > 0 \sim \frac{-1 \pm \sqrt{1+4}}{2}$$

$$(1) \cap (2) \sim \emptyset \quad (-\infty, -1) \cup$$

$$(1, +\infty)$$

فخرجنا من هنا

$$f(n) = \sqrt{n^2 + an - n^2} \sim n^2 + an - n^2 > 0$$

$$\frac{c}{a} = \frac{b^2}{4a} \sim -1 = bx - 1 \sim b = \frac{1}{p} \left\{ \begin{array}{l} a + b \frac{1}{p} - \frac{1}{4} \geq 1 \end{array} \right.$$

$$\frac{b^2}{4a} = \frac{-b}{a} \sim a = -1 + \frac{1}{p} \sim -1 + \frac{1}{p} \geq a$$

$$f(n) - n > 0$$

$$1) \ n \geq 1 \sim n^2 - 1 - n > 0 \sim n > 1 \rightarrow [1, +\infty)$$

$$2) \ n < 1 \sim n^2 + 1 - n > 0 \sim n > -1 \rightarrow [-1, 1)$$

$$1 \cup 2 \sim \emptyset \quad [-1, +\infty)$$

$$\sin \frac{\pi}{p} = \frac{\sqrt{p}}{p} \left\{ \begin{array}{l} \sin \frac{\pi}{p} + \cos \frac{\pi}{p} = 1 + \frac{\sqrt{p}}{p} \end{array} \right.$$

$$\cos \frac{\pi}{p} = 1$$

$$f(n) = n^2 - \epsilon n \sim n \left(1 + \frac{\sqrt{p}}{p} \right)^2 = \epsilon \left(1 + \frac{\sqrt{p}}{p} \right) = \frac{1}{p} + \sqrt{\frac{p}{p}} - 1 - \frac{1}{p} = -\frac{1}{p}$$

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

$$Pf = \frac{1}{R} f \frac{1}{R}$$

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

$$f(x) = x^2 - 6x \quad \left\{ \begin{array}{l} g(x) = t \\ f(g(x)) = t^2 - 6t \end{array} \right.$$

$$g(x) = \sqrt{x^2 - 1}$$

$$f(t) = t^2 - 6t = (t-3)^2 - 9 \Rightarrow t = 3$$

$$f(g(x)) = t^2 - 6t$$

$$g(x) = \sqrt{x^2 - 1} \Rightarrow x^2 - 1 = t^2 \Rightarrow x = \pm \sqrt{t^2 + 1}$$

$$f(x+3) = x^2 - 6x + 4$$

$$f(x)f(-x)$$

$$x=1 \Rightarrow f(1) = 1 - 6 + 4 = -1$$

$$x=-4 \Rightarrow f(-4) = 16 + 24 + 4 = 44$$

$$x \times \sqrt{x} = 16 \Rightarrow x = 16$$

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$$f(\epsilon \cos^n x + d \cos x) \tan^n x$$

$$\Rightarrow \cos^n x$$

$$f(r, \theta) \Rightarrow \epsilon \cos^n \theta + d \cos \theta = \frac{1}{r} \Rightarrow \epsilon \cos^n \theta + d \cos \theta = \frac{1}{r}$$

$$x = \frac{1}{r} \Rightarrow \epsilon \cos^n \theta + d \cos \theta = \frac{1}{r}$$

$$\cos \theta = \frac{1}{r} \Rightarrow \theta = \cos^{-1} \left(\frac{1}{r} \right) \Rightarrow (r) = \frac{1}{\cos \theta} \Rightarrow r = \sec \theta$$

$$g(t-f)(t+f) = 0$$

$$\left(\frac{1}{r} \right) = \cos \theta$$

$$t = \frac{1}{r} = \frac{1}{\cos \theta} = \sec \theta$$