

تاريخ: 20

أول قسم دقة

ثاني قسم دقة

ثالث قسم دقة

$$\text{الف) } f(n) = \sqrt{\frac{n-1}{n} - \frac{n}{n-1}} \quad (1)$$

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

$$\frac{n - \frac{1}{n} - n + 1}{n(n-1)} > 0 \quad + \frac{0}{\cancel{n}} - \frac{1}{\cancel{n}} + \frac{1}{\cancel{n}} -$$

$$Df = (-\infty, 0) \cup \left[\frac{1}{n}, 1\right)$$

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

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

$$n \neq 0$$

$$n \neq -1$$

$$n \neq -2$$

$$n \neq \frac{-1}{2}$$

$$n \neq 1$$

$$n \neq -2$$

$$Df = \mathbb{R} - \left\{ \frac{-1}{2}, -2, -1, 1, 0 \right\}$$

$$a) f(x) = \sqrt{\left(\left(\frac{1}{x}\right)^2 - 9\right)(x^2 - 9)}$$

(2)

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

$$x^2 = x^2 \rightarrow x^2 = 9 \rightarrow x = \pm \frac{3}{x}$$

$$\left(\frac{1}{x}\right)^2 = x^2 = \left(\frac{1}{x}\right)^{-2}$$

$$x = -2$$

$$\begin{array}{c|c|c} -2 & \frac{3}{x} & \\ \hline + & 0 & - & 0 & + \end{array}$$

$$D_f = (-\infty, -2] \cup \left[\frac{3}{x}, +\infty\right)$$

$$b) \sqrt{x-1} + \sqrt{y+1} = x$$

$$\sqrt{y+1} = x - \sqrt{x-1}$$

$$x-1 \geq 0$$

$$x \geq 1 \quad (1)$$

$$x - \sqrt{x-1} \geq 0$$

$$x \geq \sqrt{x-1}$$

$$x-1 \leq x^2$$

$$x \leq x^2 \quad (2)$$

$$D_f = [1, \infty)$$

$$(1) \cap (2) \Rightarrow 1 \leq x \leq \infty$$

$$f(n) = \frac{\log \varepsilon (n^r - n - r)}{\sqrt{n^r - 1} + 1} \rightarrow + \infty$$

(1)

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

$$\begin{array}{c} -1 \quad r \\ + \quad | \quad - \quad | \quad + \end{array} \rightarrow (-\infty, -1) \cup (r, +\infty)$$

①

$$\sqrt{n^r - 1} <$$

$$n^r - 1 > 0 \rightarrow n^r > 1 \rightarrow n > 1 \quad \begin{array}{l} (-\infty, -1) \cup [1, +\infty) \\ n < -1 \end{array}$$

②

$$\textcircled{1} \cap \textcircled{2} \Rightarrow D_f = (-\infty, -1) \cup (r, +\infty)$$

$$D_f = [-r, b]$$

$a + b = ?$

$$\sqrt{r + an - n^r}$$

③

$$r - ra - \varepsilon = 0$$

$$ra = -1 \rightarrow a = -\frac{1}{r}$$

$$\sqrt{-n^r + an + r} = \sqrt{(n + r)\left(-n + \frac{r}{r}\right)}$$

$$\begin{array}{c} -r \quad b = +\frac{r}{r} \\ - \quad | \quad + \quad | \quad - \end{array}$$

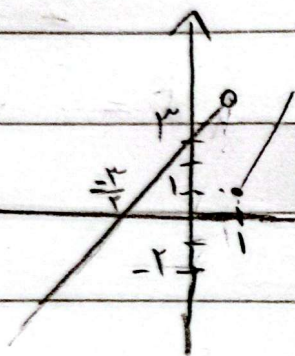
$$\sqrt{-n^r - \frac{1}{r}n + r}$$

$$a = -\frac{1}{r} \quad b = +\frac{r}{r}$$

$$a + b = \frac{r}{r} - \frac{1}{r} = \frac{r}{r} = 1$$

$$f(n) = \begin{cases} n-r & , n \geq 1 \\ n+r & , n < 1 \end{cases} \quad (2)$$

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



$$f(n) - n \geq 0$$

$$f(n) \geq n$$

$$n+r \geq n$$

$$n \geq -r \quad (3)$$

$$n-r \geq n$$

$$n \geq r \rightarrow n \geq 1 \quad (4)$$

$$(3) \cup (4) \Rightarrow Df = [-r, +\infty)$$

$$f(n) = \begin{cases} (a+1)(n+r) & ; n > 1 \\ n+r & ; n < 1 \end{cases} \quad (5)$$

$$r f(a) = f(-r) + a \rightarrow 1 \cdot a + 1 \cdot r = n - r + a$$

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

$$1 \cdot a = -1 \cdot r$$

$$f(-r) = n - r$$

$$a = \frac{-1 \cdot r}{1 \cdot 0}$$

$$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + x$$

(v)

$$f(x-\sqrt{x}) + f(x+\sqrt{x}) =$$

$$\sqrt{x-\sqrt{x}} + \frac{1}{\sqrt{x-\sqrt{x}}} + x + \sqrt{x+\sqrt{x}} + \frac{1}{\sqrt{x+\sqrt{x}}} + x =$$

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

$$\frac{x-\sqrt{x}+1}{\sqrt{x-\sqrt{x}}} + \frac{x+\sqrt{x}+1}{\sqrt{x+\sqrt{x}}} + x =$$

$$\frac{x-\sqrt{x}}{\sqrt{x-\sqrt{x}}} + \frac{x+\sqrt{x}}{\sqrt{x+\sqrt{x}}} + x =$$

$$\frac{(x-\sqrt{x})(\sqrt{x+\sqrt{x}}) + (x+\sqrt{x})(\sqrt{x-\sqrt{x}})}{\sqrt{x-\sqrt{x}} \times \sqrt{x+\sqrt{x}}} + x = \frac{\sqrt{(x-\sqrt{x})^2(x+\sqrt{x})} + \sqrt{(x+\sqrt{x})^2(x-\sqrt{x})}}{1} + x$$

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

$$\sqrt{x} + \sqrt{x} + x = \boxed{2\sqrt{x} + x}$$

$$(rf(n) - rf(-n) = r_n^r - r_n) \times r \quad (1)$$

$$(rf(-n) - rf(n) = r_n^r + r_n) \times r$$

$$rf(n) - rf(-n) = r_n^r - r_n$$

$$rf(-n) - rf(n) = r_n^r + r_n$$

$$-af(n) = r_n^r + r_n$$

$$-af(n) = n(r_n + 1)$$

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

$$(n+r)f(n) - r_n f(n+r) = r_n^r - r_{n+1} + r_{n-1} \quad (2)$$

$$f(0) = ?$$

$$n=0 \rightarrow rf(0) = r_{n-1} \rightarrow$$

$$n=-r \rightarrow rf(0) = r_x^r + r_n + r_{n-1} = a_n + 1a$$

$$\begin{cases} rf(0) = a_n + 1a \\ (rf(0) = r_{n-1}) \times -r \end{cases}$$

$$(rf(0) = r_{n-1}) \times -r$$

$$a_n + 1a - r_n + r = 0$$

$$-r_n + 1a = 0$$

$$-r_n = -1a \rightarrow n = +1a = \frac{a}{r}$$

$$rf(0) = r_x^r - 1 = \frac{r_x}{r} - 1 = \frac{r_0}{r} \rightarrow f(0) = \frac{r_0}{r}$$



$$an+b$$

$$f(n) + f\left(\frac{1}{n}\right) = \frac{3n^2 - 12n + 3}{n} \quad (10)$$

$$f(-1) = ?$$

$$an+b + \frac{1}{n}a+b = \frac{3n^2 - 12n + 3}{n}$$

$$\frac{n^2+1}{n}a + 2b = \frac{3n^2 - 12n + 3}{n} = 3n - 12 + \frac{3}{n}$$

$$= \frac{3n^2 + 3}{n} - 12$$

$$\frac{3n^2 + 3}{n} = \frac{3(n^2 + 1)}{n} = a \frac{n^2 + 1}{n} \Rightarrow a = 3$$

$$2b = -12 \rightarrow b = -6$$

$$f(n) = 3n - 6$$

$$f(-1) = -3 - 6 = -9$$