



۱

$$۱) \sin \frac{\pi}{6} + 6 \sin \frac{\pi}{6} + 2 \tan \frac{3\pi}{4} = \frac{1}{2} + (-1) + 2(-1) = \boxed{-\frac{5}{2}}$$

۲

$$\rightarrow -6 \sin \frac{5\pi}{6} + \sin \frac{2\pi}{3} - 3 \sin \frac{4\pi}{3} = -(-\frac{\sqrt{3}}{2}) + (\frac{\sqrt{3}}{2}) - 3(-\frac{\sqrt{3}}{2}) = \boxed{\frac{5\sqrt{3}}{2}}$$

$$2) 6 \tan \frac{2\pi}{3} + \sec \frac{4\pi}{3} - 2 \tan \frac{5\pi}{6} = -\frac{\sqrt{3}}{3} + 3(\frac{\sqrt{3}}{3}) - 2(-\frac{\sqrt{3}}{3}) = \boxed{\frac{4\sqrt{3}}{3}}$$

$$۳) 6 \sin(\sin \frac{\pi}{6}) + \sin(\frac{\pi}{6} \cos \frac{\pi}{6}) = 1 + 1 = \boxed{2}$$

۳

$$f(n) \begin{cases} n^2 + 4n & n \geq a \\ 2n + a + 2 & n < a \end{cases} \xrightarrow{n=a} \begin{cases} a^2 + 4a \\ 3a + 2 \end{cases} \Rightarrow a^2 + a - 2 = 0$$

$$\Rightarrow (a-1)^2 \Rightarrow a=1 \Rightarrow f(n) \begin{cases} n^2 + 4n & n \geq 1 \\ 2n + 3 & n < 1 \end{cases} \xrightarrow{f(1)} \boxed{f(1)=5}$$

۴

$$L(n) \begin{cases} 2n^2 + b & |n+1| \geq 2 \\ a + 2n & -3 \leq n \leq -1 \end{cases} \xrightarrow{n=-3} \begin{cases} 18 - b \\ a - 6 \end{cases} \Rightarrow \boxed{a+b=24}$$

۵

$$الف) y = \frac{1}{x^3 - 4x^2} \rightarrow x^3 - 4x^2 = 0 \Rightarrow x^3 = 4x^2 \xrightarrow{x \neq 0} 0, 4 \Rightarrow D_f = \mathbb{R} - \{0, 4\}$$

$$\rightarrow \frac{1}{2x^3 + 4x^2 + 2x + 4} \rightarrow x^2(2x+4) + (2x+4) \Rightarrow 2x^2(x+2) + (x+2)$$

$$\Rightarrow (x+2)(2x^2+2) \Rightarrow x \neq -2 \Rightarrow D_f = \mathbb{R} - \{-2\}$$

$$الف) y = \sqrt{n^2-1} + \sqrt{n-2} \quad \left. \begin{array}{l} n^2-1 \geq 0 \Rightarrow n^2 \geq 1 \Rightarrow n \geq 1 \\ n-2 \geq 0 \Rightarrow n \geq 2 \end{array} \right\} D_f = [2, +\infty)$$

$$٢) y = \frac{\sqrt{6-3n}}{\sqrt{6n-3}} \rightarrow \left. \begin{array}{l} 6-3n \geq 0 \Rightarrow 6 \geq 3n \Rightarrow 2 \geq n \\ 6n-3 \geq 0 \Rightarrow 6n \geq 3 \Rightarrow n \geq \frac{1}{2} \end{array} \right\} \frac{\frac{1}{2}}{-\frac{1}{3}} + \frac{2}{0-} \quad D_f = (\frac{1}{2}, 2]$$

$$y = \sqrt{6n-a} + \sqrt{b-3n} \xrightarrow{n=2} \sqrt{12-a} + \sqrt{b-6} = 0$$

$$D_f = \{2\}$$

$$\Rightarrow \left. \begin{array}{l} 12-a=0 \Rightarrow a=12 \\ b-6=0 \Rightarrow b=6 \end{array} \right\} \frac{b}{a} = \frac{1}{2}$$

$$الف) \sqrt{\frac{n^2-n+36}{n^4-13n^2+36}} = \frac{(n-3)(n+2)}{(n-3)(n+3)(n-2)(n+2)}$$

$$\Rightarrow \begin{array}{cccc} -3 & -2 & 2 & 3 \\ + & - & - & + \end{array}$$

$$D_f = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$$

$$٢) \sqrt{\frac{n^3-2n^2-5n+6}{n^3+2n^2-5n-6}}$$

$$\Rightarrow \frac{(n-3)(n-1)(n+2)}{(n-2)(n+1)(n+3)}$$

$$\begin{array}{cccccc} -3 & -2 & -1 & 1 & 2 & 3 \\ + & - & - & + & - & + \end{array}$$

$$D_f = (-\infty, 3) \cup (2, -1) \cup [1, 2) \cup [3, +\infty)$$

$$الف) y = \sqrt{2[n]-4} \rightarrow 2[n] \geq 4 \rightarrow [n] \geq 2 \rightarrow D_f = [2, +\infty)$$

$$٢) y = \sqrt{2[n]-5} \rightarrow 2[n] \geq 5 \Rightarrow [n] \geq 2.5 \Rightarrow [n] \geq 3$$

$$\Rightarrow D_f = [3, +\infty)$$

$$الف) y = \sqrt{\frac{n+1}{1n-3}} + \sqrt{\frac{6-n}{n^2+2n+4}} \Rightarrow \left. \begin{array}{l} n+1 \neq 0 \Rightarrow n \neq -1 \\ 6-n=0 \Rightarrow 6 \geq n \end{array} \right\} D_f = [-1, 6] - \{-1\}$$

نلاحظ ان المقامات لا تساوي صفر
لذلك نكتب المقامات

$$٢) \sqrt{[n]-4} + \sqrt{2-[n]} \Rightarrow 2-[n] \geq 0 \Rightarrow 2 \geq [n] \Rightarrow D_1 = (-\infty, 3)$$

$$[n]-4 \geq 0 \Rightarrow [n] \geq 4 \Rightarrow D_2 = [4, +\infty) \xrightarrow{1 \cap 2} D_f = \emptyset$$