

(1)

$$2n^2 + y^2 - 4n + 4y + k = 0$$

$$k = ? \rightarrow 2n^2 - 4n + k_1 \rightarrow k_1 \leq 2$$

$$(2n^2 - 4n + 2)$$

$$y^2 + 4y + k_2$$

$$(y+2)^2 \rightarrow k_2 = 7$$

$$k_1 + k_2 = 11$$

$$y^2 + 4y + 9$$

(2)

$$f(n) = \begin{cases} n^2 + 4n & n \geq a \\ 2n + a + 2 & n \leq a \end{cases}$$

if $n = a$

$$a^2 + 4a = 2a + a + 2$$

$$a^2 + 4a = 3a + 2$$

$$a^2 + 4a - 3a - 2 = 0$$

$$a^2 + a - 2 = 0$$

$$(a+2)(a-1) = 0$$

$$a = -2 \rightarrow a > 0 \text{ (مستحيل)}$$

$$a = 1$$

$$f(1) = ? \quad (1)^2 + 4(1) = 5$$

$$2(1) + 3 = 5$$

(3)

$$f(n) = \begin{cases} 2n^2 - b & |n+1| \geq 2 \\ a + 2n & -3 \leq n \leq -1 \end{cases}$$

$$n+1 \geq 2 \rightarrow n \geq 1$$

$$n+1 \leq -2 \rightarrow n \leq -3$$

$$y = \sqrt{2n-a} + \sqrt{b-2n}$$

if $n = -3$

$$2(-3)^2 - b = a + 2(-3)$$

$$18 - b = a - 6$$

$$a + b = 24 \quad \text{[1]}$$

$$D_y = \{2\}$$

$$12 - a = 0$$

$$b - 12 = 0$$

$$a = 12$$

$$b = 12$$

$$\frac{b}{a} = ? \rightarrow \frac{12}{12} = 1$$



(4)

$$y = \sqrt{\frac{n+1}{|n-3|}} + \sqrt{\frac{4-n}{2n^2+2n+1}}$$

$$\frac{-1}{-1+3} + \frac{3}{3+1}$$

$$\frac{3}{3+1}$$

$$D_f = [-1, 3] \cup (3, 6]$$

$$b) y = \sqrt{[n]-2} + \sqrt{2-[n]}$$

$$D_f = \emptyset$$

$$[n] \geq 2 \rightarrow n \geq 2$$

$$2 - [n] \geq 0 \rightarrow [n] \leq 2 \rightarrow n \leq 2$$

$$الف) y = \sqrt{\frac{n^2 - n - r}{n^2 + 13n^2 + 42r}} \rightarrow (n^2 - n - r)(n^2 + 13n^2 + 42r) \geq 0 \quad (6)$$

$$ب) y = \sqrt{\frac{n^2 - 2n^2 - 2n + r}{n^2 + 2n^2 - 2n - r}} \rightarrow \frac{n^2 - 2n^2 - 2n + r}{n^2 + 2n^2 - 2n - r} \geq 0 \quad D_f = (-\infty, -r) \cup (r, \infty)$$

$$الف) \Rightarrow y = \sqrt{[-n] - r} \quad [-n] - r \geq 0 \quad D_f = (-\infty, -r] \quad (7)$$

$$ب) y = \frac{2n^2 + 4n}{[n]^2 - 2[n] - 3} \quad ([n] - 3)([n] + 1) \neq 0 \quad D_f = (-\infty, -1) \cup [0, r) \cup [r, +\infty)$$

$$الف) y = \frac{\cot n + 1}{\tan n + 1} \quad \frac{\cos n}{\sin n} \rightarrow \sin x \neq 0 \quad \sin x \neq 0 \quad D_f = R - \left\{ \frac{k\pi}{\pi}, k\pi + \frac{\pi}{\pi} \right\}$$

$$ب) y = \sqrt{1 - r \sin^2 n} \quad 1 - r \sin^2 n \geq 0 \quad D_f = \left[k\pi - \frac{\pi}{r}, k\pi + \frac{\pi}{r} \right]$$

$$الف) y = \sqrt{r^{2n} - 1} \quad r^{2n} - 1 \geq 0 \quad (10) \quad \log \frac{1}{r} \leq 1 \rightarrow n-1 \geq \frac{1}{r} \rightarrow n \geq \frac{r}{r-1}$$

$$ب) y = \left(\frac{r^n + d}{r^n + r} \right) \quad \frac{r^n + d}{r^n + r} \in W \quad D_f = (-\infty, 0) \cup (r, +\infty)$$