

المسألة الأولى

المسألة الثانية

المسألة الثالثة

المسألة الأولى $y^r - r_2^r = r_2 - 1$

①

$y_1^r = r_2^r + r_2 - 1$

$y_r^r = r_2^r + r_{n-1} - 1$

$\left. \begin{array}{l} y_1^r = r_2^r + r_2 - 1 \\ y_r^r = r_2^r + r_{n-1} - 1 \end{array} \right\} \rightarrow y_1^r = y_r^r \rightarrow y_1 = y_r \quad \checkmark \text{مطلوب}$

$\Rightarrow x \cos y = y \cos x$

$y = \frac{\pi}{r} \Rightarrow x \cos \frac{\pi}{r} = \frac{\pi}{r} \cos x$

$0 = \frac{\pi}{r} \cos x \rightarrow x = \frac{\pi}{r}, \frac{2\pi}{r}, \frac{3\pi}{r}, \dots$

← من أجل
x = المطلوب

② $z = \frac{x+y}{r} = \sqrt{xy}, \quad x, y > 0$

$x+y = r \sqrt{xy}$

$x+y - r \sqrt{xy} = 0$

$(\sqrt{x} - \sqrt{y})^2 = 0 \rightarrow \sqrt{x} = \sqrt{y}$

$\sqrt{x} = \sqrt{y} \rightarrow |x| = |y| \rightarrow x = y$

③ $x y^r + r_2 - y^r - r_2 = 0$

$x(y^r + 1) - y^r - r_2 = 0$

$x(y^r + 1) = y^r + r_2 \rightarrow x = \frac{y^r + r_2}{y^r + 1} = \frac{y(y^r + 1)}{y^r + 1} = y = r_2 = y$

المسألة الثانية ④ $|x| + x^2 = r_2$

مطلوب $x^2 = r_2 - |x|$

$\begin{array}{l} \text{من أجل } x^2 = y \rightarrow \text{مطلوب} \\ \text{من أجل } x^2 = \frac{r_2}{r} \rightarrow \text{مطلوب} \end{array}$

ب) $[x] + [y] = 1 \rightarrow x = 0 \Rightarrow [y] = 1 \quad x = \text{مطلوب}$
 $\Rightarrow 1 \leq y < 2$

⑤ $f(x) = \begin{cases} x^2 - b & |x-1| \geq 2 \Rightarrow x \leq -1 \text{ أو } x \geq 3 \\ a + x & -2 < x < 2 \end{cases}$

$x = 1 \Rightarrow 1 - b = 4 + a \Rightarrow a + b = -3$

$\begin{cases} x^2 - b & |x-1| \geq 2 \\ a + x & -2 < x < 2 \end{cases}$

⑥ $f(x) = \sqrt{a - b x^2} \quad -D_f = [b, a] \quad b \in \mathbb{Z}, a \neq 0$

$-x^2 - b x + a \geq 0 \rightarrow x^2 + b x - a \leq 0 \rightarrow (x-a)(x-b) = x^2 - (a+b)x + ab = 0$

Arman

$a+b = -1 = 1$

$-x = ab$

$b = -1 \Rightarrow a = -ab = -x \cdot -1 = x$

$$y = \frac{y}{\sqrt{ax^2 + bx + c}}$$

$$D_f = (-\infty, 1)$$

$$x+c - x/b = ? \quad \textcircled{a}$$

$$ax^2 + bx + c > 0$$

$$\begin{array}{c} \text{discriminant} \\ (b^2 - 4ac) \end{array}$$

$$a=0 \rightarrow bx+c > 0 \rightarrow b(x+1) = bx+bx \rightarrow c = -bx$$

$$x+c - x/b = 0 + -bx + bx = \boxed{b}$$

$$y = \sqrt{\frac{x^2+x}{x+b}} + x$$

$$D_f = (x, +\infty)$$

$$\frac{y}{x+b}$$

④

$$\frac{x^2+x}{x+b} > 0 \rightarrow \frac{x^2+x+a(x+b)}{x+b} > 0 \rightarrow \frac{x^2+x+a(x+b)}{x+b} > 0 \rightarrow x+b > 0 \rightarrow \boxed{b > -x}$$

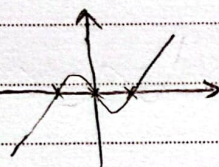
$$\frac{x(x^2+x+a(x+b))}{x+b} > 0 \rightarrow a+x=0 \rightarrow a=-x$$

$$\text{all } y = \sqrt{x^2-x}$$

$$x^2-x > 0$$

$$x(x^2-1) > 0 \rightarrow x(x+1)(x-1) > 0$$

⑤



$$D_f = [-1, 0] \cup [1, +\infty)$$

$$y = \frac{1}{\sqrt{|x|-1}}$$

$$|x|-1 > 0 \rightarrow |x| > 1$$

$$\begin{cases} x > 1 \\ x < -1 \end{cases}$$

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

$$\therefore D_f = \mathbb{R} - [-1, 1]$$

$$\text{cn) } y = \sqrt{\frac{1}{|x|-[a]}}$$

$$|x|-[a] \neq 0$$

⑥

$$|x| \neq [a]$$

$$\Rightarrow D_f = \mathbb{R} - \{a\}$$

$$\rightarrow x \neq a$$

$$y = \sqrt{x} + \sqrt{y} = 9$$

$$\sqrt{y} = 9 - \sqrt{x}$$

$$x > 0$$

$$9 - \sqrt{x} \geq 0 \rightarrow 9 \geq \sqrt{x} \rightarrow x \leq 81$$

$$\textcircled{1} \textcircled{2} \Rightarrow x \in [0, 81]$$

$$D_f = [0, 81]$$

$$y = \frac{1}{\sqrt{[x-\frac{1}{x}] + [x+\frac{1}{x}]}}$$

$$[x-\frac{1}{x}] + [x+\frac{1}{x}] + x - x > 0$$

⑦

$$[x+\frac{1}{x}] + [x+\frac{1}{x}] + x - x > 0 \rightarrow x[x+\frac{1}{x}] > 0$$

$$\rightarrow [x+\frac{1}{x}] > 0 \rightarrow x+\frac{1}{x} \geq x-\frac{1}{x} \geq \frac{1}{x} \rightarrow x \geq \frac{1}{x}$$

$$D_f = [\frac{1}{x}, +\infty)$$

Arman

$$y = \sqrt{1 - \log(x-a)}, D_f = (b, c], x-a > 0 \rightarrow x > a \rightarrow x > \frac{a}{p}$$

$$\frac{a}{p} < x \leq \frac{1+a}{p}$$

⑧

$$1 - \log(x-a) > 0 \rightarrow -1 > \log(x-a) \rightarrow 1 > x-a \rightarrow \frac{1+a}{p} > x \rightarrow c-b = \frac{1+a}{p} - \frac{a}{p} = \frac{1}{p} = \boxed{\omega}$$