

۱)  $\sqrt{\frac{(n-1)^2 - n^2}{n(n-1)}} = \sqrt{\frac{-2n+1}{n(n-1)}}$   $\frac{1}{+} \frac{1}{-} \frac{1}{+} \frac{1}{-} (-\infty, 0) \cup [\frac{1}{2}, 1)$

۲)  $f(x) = \frac{1}{x+1} - \frac{2}{x} \rightarrow \frac{1}{x+1} - \frac{2}{x} \neq 0 \rightarrow -1, 0, 1, 2 \neq x \rightarrow \left( \frac{-x-2}{x(x+1)}, \frac{2x+0}{(x-1)(x+2)} \right)$   
 $\rightarrow \frac{(-x-2)(x-1)(x+2)}{x(x+1)(2x+0)} \rightarrow x \neq -\frac{5}{2}$   
 $\mathbb{R} \setminus \{-1, 0, 1, 2, -\frac{5}{2}\} \sim \frac{(-x-2)(x-1)(x+2)}{x(x+1)(2x+0)}$

الف)  $(\frac{1}{x})^x \geq 3^2 \rightarrow 3^{-x} \geq 3^2 \rightarrow -x \geq 2 \rightarrow x \leq -2 \rightarrow N \Rightarrow (-\infty, -2]$   
 $3^0 \geq (x^x)^2 \rightarrow 2^0 \geq 2^x \rightarrow 0 \geq x$   
 $\rightarrow (\frac{1}{x})^x - 9 \leq 0 \rightarrow (\frac{1}{x})^x \leq 9 \rightarrow 3^{-x} \leq 3^2 \rightarrow -x \leq 2 \rightarrow x \geq -2 \rightarrow N + 2, 0 \leq x$   
 $\rightarrow 2^0 \leq (x^x)^2 \rightarrow 2^0 \leq 2^x \rightarrow 0 \leq x$   
 $y = -1 - x = -x \rightarrow -1 \leq y \leq 1, 1 \leq x \leq 1 \rightarrow x = 1$   
 $y = 0 \rightarrow x = 1$   
 $y = 1 \rightarrow x = 0$   
 جواب نهایی:  $(-\infty, -2] \cup [2, +\infty)$

۳)  $h(x) = \frac{\log(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1} \rightarrow x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0$

$x^2 - 1 > 0 \rightarrow x^2 > 1 \rightarrow |x| > 1$   
 $\rightarrow x > 1$   $\rightarrow x < -1$   
 جواب نهایی:  $(-\infty, -1) \cup (2, +\infty)$

$[-2, b]$

$\rightarrow x = -2 \sim y = 0 \rightarrow 3 - 2a - 1 = 0 \rightarrow -2a - 1 = 0 \rightarrow -2a = 1 \rightarrow a = -\frac{1}{2}$

$a = -\frac{1}{2} \rightarrow \sqrt{3 - \frac{1}{2}x - x^2} \rightarrow \sqrt{-(x^2 + \frac{1}{2}x - 2)} \sim \frac{3}{4}, -2$

$a + b = -\frac{1}{2} + \frac{3}{4} = \frac{1}{4}$

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

۴)  $h(x) - x > 0 \rightarrow h(x) > x \xrightarrow{x \geq 1} 2x - 2 > 0 \rightarrow x > 1 \checkmark$

$\xrightarrow{x < 1} x + 3 > 0 \rightarrow x > -3 \rightarrow -3 < x < 1$

$\rightarrow D_{h(x)} = [-3, 1) \cup [1, +\infty)$

$$b'(0) \xrightarrow{0 > 1} (a+1)r \rightarrow b'(0) = 1/a + 4$$

$$b(-r) \xrightarrow{-r} ra - 1$$

$$\Rightarrow b'(0) = b'(-r) + a \rightarrow 1/a + 4 = ra - 1 + a$$

$$1/a = -1/a \rightarrow a = -1/a$$

6

$$\begin{aligned} & \sqrt{r-5r} + \frac{1}{\sqrt{r+5r}} + r + \sqrt{r+5r} + \frac{1}{\sqrt{r-5r}} + r \\ & \xrightarrow{(\sqrt{r-5r})} \frac{1-5r}{r-\sqrt{r}+1} + \frac{(\sqrt{r-5r})}{r+\sqrt{r}+1} + r = \frac{\sqrt{r+5r}(1-5r)}{1} + \frac{\sqrt{r-5r}(r+5r)}{1} + r \\ & = \sqrt{r+5r} - (\sqrt{r+5r}) \times 5r + r\sqrt{r-5r} + (\sqrt{r-5r}) \times 5r + r \end{aligned}$$

7

$$\begin{aligned} & r b(x) - r b(-x) = r x^r - x \xrightarrow{\Delta} r b(x) - r b(-x) = 1 x^r - r x \\ & \xrightarrow{-\Delta} r b(-x) - r b(x) = 1 x^r + x \xrightarrow{\Delta} -r b(x) + r b(-x) = 1 x^r + r x \\ & \quad \quad \quad - \Delta b(x) = r_0 x^r + x \end{aligned}$$

8

$$\xrightarrow{-\Delta} b(x) = \frac{r_0 x^r + x}{-\Delta} = -r x^r - \frac{x}{\Delta}$$

$$r b(0) = r_{m-1} \rightarrow b(0) = \frac{r_{m-1}}{r}$$

$$x = -r \rightarrow +r b(0) = r(-r)^r + \Delta m - 1 \Rightarrow \frac{1\Delta + \Delta m}{r} = b(0)$$

$$\frac{1\Delta + \Delta m}{r} = \frac{r_{m-1}}{r} \xrightarrow{\Delta} 1\Delta + \Delta m = r_{m-1} \rightarrow r_m = 1/a \rightarrow m = r/a$$

9

$$x=1 \sim r b(1) = \frac{r-1r+1}{1} \sim b(1) = -1 \sim b(1) = -r$$

$$x=-1 \sim r b(-1) = \frac{r+1r+1}{-1} = -1/a \sim \boxed{b(-1) = -1/a}$$

1