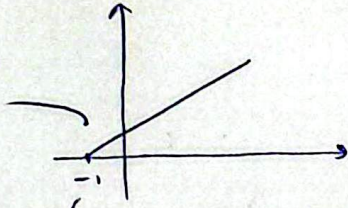


① $x = \begin{cases} 2y-1 & y \geq 0 \\ -y^2 & y > 1 \end{cases} \rightarrow \begin{cases} 2y-1 & y \geq 0 \rightarrow n = [-1, +\infty) \\ -y^2 & y > 1 \rightarrow n = (-\infty, -1] \end{cases}$ نقص عباس



$x = -1 \rightarrow y = 0 \leq y = 1$
 $\downarrow$ $\downarrow$
 $y \geq 0$ $y > 1$

$\begin{cases} 2y-1 \rightarrow \frac{n+1}{2} = y \\ \pm \sqrt{-n} = y \end{cases} \quad y > 1$

② $g(x) = \sqrt{\frac{x f(x-r)}{f(x)}} = \sqrt{\frac{x f(n-r)}{f(n)}} \geq 0$

	-r	-r	0	r	Δ	V
$f(x-r)$	-	-	+	+	+	+
x	-	-	-	+	+	+
$f(n)$	+	+	+	+	+	+
p	+	+	-	+	+	+

$\uparrow \quad f(n-r) \rightarrow \underline{\Delta}, \underline{V}$

$D_{f(n)} = \mathbb{R} - \{ \epsilon \}$

$D_{f(n-r)} = \mathbb{R} - \{ \epsilon \}$

$D_x = \mathbb{R} - \{ -\epsilon, r, \epsilon, \Delta, \epsilon \}$

③ $f(n) = \frac{r n^2 - r n + r}{n^2 - \epsilon n}$

الف) $D_{f(n)} = ? \rightarrow D_{f(n)} = n^2 - \epsilon n \neq 0 \rightarrow n^2 - \epsilon n = 0$
 $n(n-r)(n+r) = 0 \rightarrow \begin{cases} n = 0 \\ n = r \\ n = -r \end{cases}$

$D_{f(n)} = \mathbb{R} - \{ 0, r, -r \}$

ب) $\sqrt{f(n)} = \sqrt{\frac{r n^2 - r n + r}{n^2 - \epsilon n}} = \frac{r n^2 - r n + r}{n^2 - \epsilon n} \geq 0 \rightarrow r n^2 - r n + r \rightarrow \Delta < 0$

$b^2 - 4ac = 9 - 14 = -5 < 0 \rightarrow n_{ext} = -\frac{b}{2a} = \frac{r}{\epsilon} \rightarrow y = (r \times \frac{9}{14}) \times \frac{9}{\epsilon} + r = \frac{V}{\epsilon} \rightarrow$

$\rightarrow 0 \leq n^2 - \epsilon n \rightarrow 0 < n(n-r)(n+r) \rightarrow 0 < n(n-r)(n+r)$

-r	0	r
-	+	+

$\rightarrow D_f = (-r, 0) \cup (r, +\infty)$

$$⑤ \quad y = \sqrt{\frac{x-r}{x^2-rx-1}} \rightsquigarrow \frac{x-r}{x^2-rx-1} \geq 0$$

$$\frac{x-r}{(x^2-\varepsilon)(x^2+r)} = \frac{x-r}{(x-r)(x+r)(x^2+r)} \quad \text{always } p$$

$$\frac{-r}{-1} + \frac{r^*}{1} \quad (-r, +\infty)$$

$$\therefore \frac{r^2+1}{x-r[-x]} \rightarrow x-r[-x] = 0 \rightsquigarrow x=r[-x] \rightarrow x = [-x]$$

$$\downarrow$$

$$r \leq -x \leq r$$

$$-r \leq x \leq -r$$

$$D_{f(x)} = (-r, r]$$

$$⑥ \quad f(x) = \frac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}} \Rightarrow \sqrt{x(x^2-1)} \rightsquigarrow 0 \leq x(x^2-1)$$

$$\rightarrow 0 \leq x(x-1)(x+1) \quad \frac{-1}{-1} \quad \frac{0}{0} \quad \frac{1}{1}$$

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

$$\sqrt{|x|+x} \begin{cases} \rightarrow 0 \leq x \rightarrow x+x = 2x \quad \overline{00} \\ \rightarrow x \leq 0 \rightarrow -x+x = 0 \quad \overline{00} \end{cases} \quad D = (0, +\infty)$$

$$D_I \cap D_{II} \rightarrow [1, +\infty)$$

$$\therefore f(x) = \frac{\sqrt{|x-r|-x^r}}{|x|-1} \rightsquigarrow \sqrt{|x-r|-x^r} \rightarrow 0 \leq |x-r|-x^r$$

$$\begin{array}{c} x < r & r < x \\ -x^r - x^r & x - x - x^r \rightsquigarrow \boxed{-x^r + x - r} \end{array} \quad \begin{matrix} \nearrow 1 \\ \searrow -1 \end{matrix}$$

$$\frac{-b}{ra} = \frac{1}{r} \rightarrow \frac{-\Delta}{\varepsilon a} = -\frac{r}{\varepsilon} < 0$$

$$\frac{-r}{-1} \quad \frac{1}{1} \quad D = [-r, 1] \cap [-\infty, r] \Rightarrow [-r, r]$$

$$|x|-1 \neq 0 \rightarrow |x| \neq 1, \quad x \neq 1, -1$$

$$D_{f(x)} = [-r, r] - \{-1, 1\}$$

$$⑥ y = \sqrt{(x-1)[x-2]}$$

$$(x-1)[x-2] \geq 0 \quad \begin{array}{c} 1 \quad 2 \\ - \quad + \end{array} \rightarrow D_f(x) = [1, 2] \cup [2, +\infty)$$

$$\Rightarrow \sqrt{|x-1|[x-2]} \rightarrow \begin{array}{c} 1 \quad 2 \quad 2 \\ - \quad - \quad 0 \quad + \end{array} \quad D_f(x) = [1, 2] \cup [2, +\infty) \cup \{1\}$$

$$⑦ \frac{1}{|x-1|-1} - k \rightarrow |x-1|-1-k=0 \quad (k=1)$$

$$|x-1|-1=k \rightarrow |x-1|-1=\pm k \rightarrow +k \quad \begin{array}{c} k > 0 \\ k+1 > 0 \end{array}$$

$$|x-1| = \pm k+1$$

$$\begin{aligned} k+1 > 0 &\rightarrow |x-1|-1=1 \rightarrow |x-1|=2 \rightarrow x=3 \text{ or } x=-1 \\ &\rightarrow |x-1|-1=-1 \rightarrow |x-1|=0 \rightarrow x=1 \end{aligned}$$

$$⑧ f(x) = \frac{x^2+3x+2}{x^2+2x+1} \rightarrow \begin{aligned} x-1 &\neq 0 \rightarrow x \neq 1 \\ \frac{x+1}{x-1} &\neq 0 \rightarrow x \neq -1 \end{aligned}$$

$$x^2+3x+2 \neq 0 \rightarrow (x+1)(x+2) \neq 0 \rightarrow x \neq -1, -2$$

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

$$⑨ \log_{x+1} \log_{\frac{1}{x}} \rightarrow \begin{aligned} \log_{x+1} &\rightarrow x+1 \neq 1 \rightarrow x \neq 0 \\ x+1 &> 0 \rightarrow x > -1 \\ \log_x &\rightarrow 0 < x \rightarrow x \neq 1 \end{aligned} \Rightarrow$$

$$D_f(x) = (0, +\infty) - \{1\}$$

$$(1.) \text{ If } |x^r - 1| \rightarrow 0$$

$$D_F(x) = [-\Delta x^r]$$

$$-\Delta \leq x^r - 1 \leq \Delta \rightarrow -\frac{\Delta}{r} \leq x^r \leq \frac{\Delta}{r} \rightarrow -\frac{\Delta}{r} \leq x \leq \frac{\Delta}{r}$$

$$\frac{-\Delta}{\sqrt{r}} \leq x \leq \frac{\Delta}{\sqrt{r}} \rightarrow D_N = \left[-\frac{\Delta \sqrt{r}}{r}, \frac{\Delta \sqrt{r}}{r} \right]$$