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$$f(x) = \sqrt{(a-2)x^2 + ax + b} \quad [x, +\infty)$$

$$x=3 \text{ ————— } x=3 \text{ ————— } (a-2)9 + 3a + b - 4 = 9a - 18 + 3a + b = 0$$

$$b = -9a + 18 - 3a \text{ ————— } b = -12a + 18$$

$$x=0 \text{ ————— } \alpha - 2 = 0 \text{ ————— } \alpha = 2$$

$$-12\alpha + 18 \text{ ————— } \alpha = 2 \text{ ————— } -24 + 18 = -6 \text{ ————— } b = -6$$

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$$f(x) = \sqrt{x^2 + 2x + 2 - m^2} \text{ ————— } \sqrt{x^2 + 2x + 1 + 1 - m^2} \text{ ————— } (x+1)^2 + 1 - m^2$$

$$(x+1)^2 + 1 - m^2 \geq 0 \text{ ————— } (x+1)^2 + 1 \geq m^2$$

$$x = -1 \text{ ————— } 0 + 1 \geq m^2 \text{ ————— } 1 \geq m^2 \text{ ————— } 1 \geq m \geq -1 \text{ ————— } \begin{cases} m_{\max} = 1 \\ m_{\min} = -1 \end{cases}$$

$$m_{\max} - m_{\min} = 1 - (-1) = 2$$

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$$f(x) = \sqrt{4 - x^2} \text{ ————— } 4 - x^2 \geq 0 \text{ ————— } -2 \leq x \leq 2 \text{ (I)}$$

$$[x] + [-x] + 1 \text{ ————— } [x] + [-x] + 1 \neq 0 \text{ ————— } [x] + [-x] \neq -1$$

$$[x] + [-x] \neq -1 \text{ ————— } \begin{cases} 0 & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases}$$

$$x \in \mathbb{Z} \text{ (II)}$$

$$(I \cap II) \text{ ————— } [-2, 2] \text{ ————— } -2, -1, 0, 1, 2$$

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$$y = \sqrt{x^3 + 4x^2} \text{ ————— } x^3 + 4x^2 \geq 0 \text{ ————— } x^2(x+4) \geq 0 \text{ ————— } x+4 \geq 0$$

$$D_f = \mathbb{R} \text{ ————— } 0 \leq x < \infty$$

$$II, x \geq -4$$

$$(I \cap II) \text{ ————— } D_f = [-4, +\infty)$$

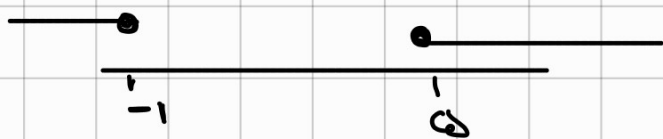
$$y = \sqrt{\frac{x^3 - 1}{x^3 - 1}} \text{ ————— } \begin{cases} x^3 - 1 = (x-1)(x+1) \\ x^3 - 8x^2 = x^2(x-8) \end{cases}$$

$$\frac{x^3 - 1}{x^3 - 8x^2} \text{ ————— } \frac{(x+1)x^2(x-8)}{x^2(x+1)} \text{ ————— } x \neq 1 \text{ ————— } \begin{cases} x+1, x-8, x^2 \geq 0 \text{ ————— } x \geq 0, x \neq 1 \\ x^2 + x + 1 > 0 \text{ ————— } \Delta < 0 \end{cases}$$

$$\begin{array}{c|ccc} & -4 & 0 & 8 \\ \hline + & - & 0 & - & + \end{array}$$

$$D_f = (-\infty, -1] \cup \{0\} \cup [3, +\infty)$$

الف: $y = \sqrt{|x-1|-x}$ $|x-1|-x \geq 0 \rightarrow |x-1| \geq x \rightarrow x-1 \leq -x \rightarrow x \leq -1$
 $|x-1|-x \geq 0 \rightarrow x-1 \geq x \rightarrow x \geq 1$



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

ب: $y = \sqrt{x^2 - 4x + 4}$ $x^2 - 4x + 4 \geq 0 \rightarrow x \geq 4 - x \rightarrow |4 - x| = |x - 4|$

$$|x - 4| \leq 4 \rightarrow -4 \leq x - 4 \leq 4 \rightarrow 0 \leq x \leq 8$$

$$D_f = [0, 8]$$

الف: $y = \sqrt{1 - |x|}$ $1 - |x| \geq 0$

I: $x < 0 \rightarrow |x| = -x \rightarrow 1 - x \geq 0 \rightarrow 1 + x^p \geq 0 \rightarrow (-\infty, 1]$

II: $x \geq 0 \rightarrow |x| = x \rightarrow 1 - x \geq 0 \rightarrow 1 - x^p \geq 0 \rightarrow 1 \geq x^p \rightarrow 1 \geq x$

$$I \cup II \rightarrow (-\infty, 1] \cup [0, 1]$$

$$[0, 1] \leftarrow 0 \leq x \leq 1 \leftarrow x \geq 0$$



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

ب: $y = \frac{1}{\sqrt{x^2 - 4x + 4} - 1}$

الف: $x^2 - 4x + 4 \geq 0 \rightarrow |x - 2| \leq 2 \rightarrow 0 \leq x \leq 4$

ب: $\sqrt{x^2 - 4x + 4} - 1 \neq 0 \rightarrow x^2 - 4x + 4 \neq 1 \rightarrow |x - 2| \neq 1 \rightarrow x \neq 1, x \neq 3$

$$D_f = [0, 1) \cup (1, 3) \cup (3, 4]$$

الف: $y = \frac{\sin x - 1}{\cos x}$ $\cos x \neq 0 \rightarrow x \neq \frac{\pi}{2} + k\pi, k \in \mathbb{Z}$

$$D_f = \{x \mid \frac{\pi}{2} + k\pi \neq x \mid k \in \mathbb{Z}\}$$

ب: $y = \frac{\cos x}{\cos x - 1}$ $\cos x - 1 \neq 0 \rightarrow \cos x \neq 1 \rightarrow x \neq 2k\pi, k \in \mathbb{Z}$

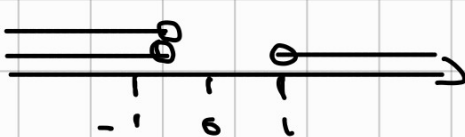
$$D_f = \{x \mid 2k\pi \neq x \mid k \in \mathbb{Z}\}$$

$\lim_{n \rightarrow \infty} \frac{n+1}{|n+1| - |n+1|} \rightarrow |n+1| - |n+1| \neq 0 \rightarrow n+1 = n+1 \rightarrow n = 0$ 1
 $\hookrightarrow n+1 = -(n+1) \rightarrow n = -\frac{n}{2}$

$D_F = \mathbb{R} - \left[-\frac{F}{F}, F \right]$ Ⓢ

$\hookrightarrow y = \sqrt{|n+1| - |n+1|} \rightarrow |n+1| - |n+1| > 0 \rightarrow (n+1)^2 > (n+1)^2$
 $F n^2 + F n + 1 \geq n^2 + 4n + 4 \rightarrow F n^2 - n - 1 > 0 \rightarrow (F n + F) (n - F) > 0 \rightarrow \begin{cases} n < -\frac{F}{F} \\ n > F \end{cases}$
 $D_F = (-\infty, -\frac{F}{F}) \cup (F, +\infty)$

$f(x) = \sqrt{\log_{0.1} \log_{0.1} (x-1)}$ Ⓢ
 $\frac{1}{x} < 1 \rightarrow \log_{\frac{1}{x}} > 0 \rightarrow$ 9
 $0 < \log_{\frac{1}{x}} - 1 \leq 1 \rightarrow 1 < n-1 < 2 \rightarrow 1 < n \leq 2$
 $D_F = (1, 2]$

$\lim_{n \rightarrow \infty} \log_2 (2 \cos n + 1)$ 10
 $2 \cos n + 1 > 0 \rightarrow 2 \cos n > -1 \rightarrow$
 $\{n \mid n \in (\frac{2\pi}{3} - \frac{\pi}{6}, \frac{2\pi}{3} + \frac{\pi}{6}) \mid k \in \mathbb{Z}\}$ Ⓢ
 $\hookrightarrow y = \sqrt{\log \frac{x-1}{x+1}} \rightarrow \textcircled{1} \frac{x-1}{x+1} > 0 \mid x < -1 \text{ or } x > 1$
 $\textcircled{2} \log \frac{x-1}{x+1} > 0 \rightarrow \frac{x-1}{x+1} > 1 \rightarrow \frac{x-1}{x+1} - 1 > 0 \rightarrow -\frac{2}{x+1} > 0 \rightarrow x < -1$
 $\textcircled{1} \cap \textcircled{2}$

 $D_F = (-\infty, -1) \cup (1, \infty)$

