

$$(a-r)x^2 + ax + b$$

$$a-r=0 \rightarrow a=r$$

$$r(x+b) > 0 \rightarrow x > -b/r$$

$$-b/r = r \rightarrow b = -r^2$$

$$f(x) = (x^2 + rx + r - m^2) \rightarrow x^2 + rx + r - m^2 \geq 0 \rightarrow$$

$$\Delta \leq 0 \rightarrow \Delta = r^2 - 4(1)(r - m^2) = r^2 - 4r + 4m^2 = (r-2)^2 - 4m^2$$

$$(r-2)^2 - 4m^2 \leq 0$$

$$m^2 \leq 1$$

$$-1 \leq m \leq 1$$

$$\max(m) - \min(m) = 1 - (-1) = 2$$

$$\frac{\sqrt{\epsilon - x^2}}{[x] + [-x] + 1} \rightarrow \epsilon - x^2 \geq 0 \rightarrow -r \leq x \leq r$$

$$[x] + [-x] = 0 \rightarrow \{-r, -1, 0, 1, r\}$$

$$\rightarrow \text{if } x \in \mathbb{Z}$$

هذه الفواصل

$$\sqrt{x^2 + rx} = \sqrt{(x^2)(x+r)}$$

$$x^2 \geq 0$$

$$(x+r) \geq 0$$

$$\rightarrow D: [-r, +\infty)$$

همواره مثبت با ۰

$$D: (-\infty, -1] \cup \{0\} \cup [r, +\infty)$$

$$\sqrt{(x^2-1)(x^2-rx^2)} \rightarrow (x-1)(x+1) \times x^2(x-r) \geq 0 \rightarrow (x+1)(x-r) \geq 0$$

$$x^2-1 \rightarrow (x-1)(x+1) \rightarrow x \neq 1 \rightarrow x \leq -1 \text{ or } x \geq r$$

$$\text{ب) } y = \sqrt{|x-r|} - r \rightarrow |x-r| \geq r^2 \rightarrow x \geq r \text{ or } x \leq -r$$

$$D: (-\infty, -1] \cup [r, +\infty)$$

$$\text{ج) } \sqrt{\epsilon - |r-x|} \rightarrow |r-x| \leq \epsilon \rightarrow -r \leq x \leq r \quad D: [-r, r]$$

$$y = \sqrt{1-x|x|} \rightarrow x|x| \leq 1 \xrightarrow{x \geq 0} x^2 \leq 1 \rightarrow 0 \leq x \leq 1$$

$$x \leq 0 \rightarrow -x^2 \leq 0 < 1 \rightarrow \checkmark \quad D: (-\infty, 1]$$

$$\therefore) \frac{1}{\sqrt{r-|x-1|}} \rightarrow r-|x-1| > 0$$

$$\rightarrow |x-1| < r \rightarrow D: (r, r+1)$$

$$y = \frac{\sin^2 x - 1}{\cos x} \rightarrow \cos x \neq 0 \rightarrow D: x \neq \frac{\pi}{2} + k\pi$$

$$\therefore) y = \frac{\cos x}{r \cos x - 1} \rightarrow \cos x \neq \frac{1}{r} \rightarrow D: x \neq \pm \frac{\pi}{r} + k\pi$$

$$\text{الف) } y = \frac{x+r}{r(x+1)-|x+r|} \rightarrow (x+1) \neq |x+r| \rightarrow (x+1)^2 - (x+r)^2 \neq 0 \rightarrow x \neq \frac{r}{2}$$

$$D: x \neq \frac{r}{2}, x \neq -\frac{r}{2} \quad \left\{ \begin{array}{l} x = \frac{r}{2} \\ x = -\frac{r}{2} \end{array} \right.$$

$$\therefore) y = \sqrt{|r(x+1)-|x+r||} \rightarrow |r(x+1)| \geq |x+r|$$

$$D: (-\infty, -\frac{r}{2}] \cup [\frac{r}{2}, +\infty)$$

$$f(x) = \sqrt[3]{\log_{\frac{1}{10}}(rx-1)} \rightarrow rx-1 > 0 \rightarrow x > \frac{1}{r}$$

$$\log_{\frac{1}{10}}(rx-1) \geq 0 \rightarrow \log_{\frac{1}{10}}(rx-1) \leq (\log_{\frac{1}{10}})^0 = 1$$

$$\log_{\frac{1}{10}}(rx-1) \geq 0 \rightarrow rx-1 \leq 1 \rightarrow x \leq \frac{2}{r}$$

$$D: (\frac{1}{r}, \frac{2}{r}]$$

$$\text{الف) } \log(r \cos x + 1) \rightarrow r \cos x + 1 > 0 \rightarrow \cos x > -\frac{1}{r} \quad D: x \in (-\frac{\pi}{r}, \frac{\pi}{r}) \cup (\frac{\pi}{r}, \frac{3\pi}{r}) \cup \dots$$

$$\therefore) y = \sqrt{\log \frac{x-1}{x+1}} \rightarrow \frac{x-1}{x+1} > 0 \rightarrow \boxed{x < -1} \text{ or } x > 1$$

$$\log \frac{x-1}{x+1} \geq 0 \rightarrow \frac{x-1}{x+1} \geq 1 \rightarrow \frac{x-1}{x+1} - 1 \geq 0$$

$$\frac{(x-1)-(x+1)}{x+1} \geq 0$$

$$\frac{-2}{x+1} \geq 0 \rightarrow x+1 < 0 \rightarrow x < -1$$

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