

$$(a-r)x^2 + ax + b \geq 0 \rightarrow (x \geq r) \Rightarrow a \geq r \rightarrow \max x = r$$

$$(a-r)(r)^2 + ra + b \geq 0 \rightarrow (a-1+2a+b) \geq 0 \rightarrow b \geq 1-4a \rightarrow a \geq r$$

$$b \geq 1-4r \rightarrow -4 \rightarrow -4 \leq b$$

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$$x^2 + rx + r - m^2 \geq 0$$

$$x^2 + rx + r - m^2 = (x+1)^2 + 1 - m^2$$

$$1 - m^2 \geq 0 \rightarrow m^2 \leq 1 \rightarrow -1 \leq m \leq 1 \rightarrow \max x = 1$$

$$\min x = -1 \Rightarrow 1 - (-1) = 2$$

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۱) $x^2 - x^2 \geq 0$ $x^2 - x^2 \geq 0$

$$-2 \leq x \leq 2 \rightarrow [x] + [-x] = -1$$

$$\Rightarrow -1 + 1 = 0 \Rightarrow \text{همواره صحت دارد}$$

$$[x] + [-x] = x - x = 0 \rightarrow x \in \mathbb{Z}$$

$$\leftarrow \text{مجموعه} = 1$$

$$\Rightarrow -2, -1, 0, 1, 2 \rightarrow \text{قرار (d)}$$

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الف) $x^4 + 3x^2 \geq 0 \Rightarrow x^2(x^2 + 3) \geq 0 \rightarrow x^2 = 0$

$$\frac{x^2}{x^2 + 3} \geq 0 \rightarrow D = [-3, +\infty)$$

ب) $x^2 - 1 \neq 0$ $x \neq \pm 1$

$$\Rightarrow \frac{(x^2 - 1)(-x^2)}{x^2 - 1} = -x^2 \Rightarrow y = \sqrt{-x^2} \rightarrow -x^2 \geq 0 \Rightarrow x = 0$$

$$D = \{0\} \cup [1, +\infty)$$

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الف) $|x-2| - 4 \geq 0$

$$|x-2| \geq 4 \Rightarrow x-2 \geq 4 \text{ یا } x-2 \leq -4 \rightarrow x \geq 6, x \leq -2$$

$$D = (-\infty, -2] \cup [6, +\infty)$$

ب) $d - |x-2| \geq 0 \Rightarrow |x-2| \leq d$

$$\Rightarrow -d \leq x-2 \leq d \rightarrow -d+2 \leq x \leq d+2$$

$$D = [-2, 4] \quad -2 \leq x \leq 4$$

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$$\text{الف) } |x| \geq 0 \rightarrow x \geq 0 \rightarrow |x| = x \rightarrow 1 - x^2 \geq 0 \rightarrow -1 \leq x \leq 1 \rightarrow 0 \leq x \leq 1$$

$$\text{ب) } |x| < 0 \Rightarrow |x| = -x \rightarrow 1 - x(-x) = 1 + x^2 \geq 0 \rightarrow \text{دائماً صحيح}$$

$$\text{ج) } (x < 0) \rightarrow D = (-\infty, +1]$$

$$\text{د) } r - |x - a| \geq 0 \rightarrow |x - a| \leq r \rightarrow r \leq x \leq a + r$$

$$\sqrt{r - |x - a|} \neq 0 \rightarrow \sqrt{r - |x - a|} \neq 1 \rightarrow r - |x - a| \neq 1 \rightarrow |x - a| \neq r \quad x \neq r \quad x \neq -r$$

$$D = [r, a] \cup (a, r) \cup (-r, a] \cup (-a, -r)$$

$$\text{الف) } \sin^2 x - 1 = -\cos^2 x$$

$$y = -\cos^2 x \rightarrow \cos^2 x \neq 0 \Rightarrow x \neq \frac{\sqrt{1}}{r} + k\pi \quad (k \in \mathbb{Z})$$

$$D = \mathbb{R} \setminus \left\{ \frac{\pi}{2} + k\pi, k \in \mathbb{Z} \right\}$$

$$\text{ب) } r \cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{r} \rightarrow x \neq r k \pi \pm \frac{\pi}{r} \rightarrow D = \mathbb{R} \setminus \left\{ r k \pi \pm \frac{\pi}{r}, k \in \mathbb{Z} \right\}$$

$$\text{الف) } |rx + v| - |x + r| \neq 0$$

$$|rx + v| \neq |x + r| \rightarrow (rx + v) \neq (x + r) \rightarrow x \neq -\frac{r}{r-1}$$

$$D = \mathbb{R} \setminus \left\{ -\frac{r}{r-1}, -\frac{1}{r-1} \right\}$$

$$\text{ب) } |rx + v| + |x + r| \geq 0 \rightarrow rx^2 + rx + r + x + r \geq 0 \rightarrow rx^2 + (r+1)x + 2r \geq 0$$

$$D = (-\infty, -\frac{r}{r-1}) \cup \left[-\frac{1}{r-1}, +\infty \right)$$

$$rx - 1 > 0$$

$$x > \frac{1}{r} \rightarrow \log_{0.8}(\log_{0.8}(rx - 1)) \geq 0$$

$$\log_{0.8}(u) \geq 0 \rightarrow 0 < u \leq 1 \rightarrow 0 < \log_{0.8}(rx - 1) \leq 1$$

$$\log_{0.8}(rx - 1) \leq 1$$

$$D = \left[\frac{r}{r-1}, 1 \right)$$

$$\log_{0.8}(rx - 1) > 0$$

$$rx - 1 \geq 0.8 \rightarrow rx \geq 1.8$$

$$x \geq \frac{1.8}{r}$$

$$\frac{1}{r} < x \leq 1 \rightarrow \frac{1.8}{r} < x - 1 \leq 1$$

$$\text{الف) } r \cos x + 1 > 0$$

$$\cos x > -\frac{1}{r} \rightarrow -\frac{r\pi}{r} < x < \frac{r\pi}{r} \rightarrow D = \bigcup_{k \in \mathbb{Z}} \left(-\frac{r\pi}{r} + rk\pi, \frac{r\pi}{r} + rk\pi \right)$$

$$\text{ب) } \log\left(\frac{x-1}{x+1}\right) \geq 0 \rightarrow \frac{x-1}{x+1} \geq 1 \rightarrow x \neq -1$$

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

$$x < -1 \rightarrow D = (-\infty, -1)$$