

$a=2 \rightarrow$ ضرب x^2 منبسط

$2x+b \geq 0 \quad x \geq -\frac{b}{2} \quad -\frac{b}{2} = 3 \quad \boxed{b = -6}$

$x^2+2x+2-m^2 \geq 0 \quad \Delta \leq 0 \quad 4-4(2-m^2) \leq 0$
 $(2-m^2) \geq 1 \quad m^2 \leq 1 \quad -1 \leq m \leq 1 \quad 1-(-1) = 2$

$[x] + [-x] \rightarrow \begin{cases} x \text{ عضو } \mathbb{Z} \rightarrow 0 \\ x \notin \mathbb{Z} \rightarrow -1 \end{cases}$
 $\sqrt{4-x^2} \rightarrow 4-x^2 \geq 0 \quad x^2 \leq 4 \quad -2 \leq x \leq 2$
 $x = \{-2, -1, 0, 1, 2\}$
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$x^2(x+2) \geq 0 \quad \frac{-2 \quad 0}{-\phi \quad + \quad \phi \quad +} \quad x = [-2, +\infty)$
 $\frac{x^2(x-1)(x+1)(x-2)}{(x-1)(x^2+x+1)} \geq 0 \quad \begin{matrix} * & * \\ -1 & 0 & 1 & 2 \\ + & \phi & - & \phi & - & \phi & + \end{matrix}$
 $x = (-\infty, 1] \cup \{0\} \cup [2, +\infty)$

الف) $|x-2|-3 \geq 0 \quad |x-2| \geq 3 \quad x-2 \geq 3 \quad \boxed{x \geq 5}$
 $x-2 \leq -3 \quad \boxed{x \leq -1} \quad x = (-\infty, -1] \cup [5, +\infty)$
 ب) $4-|2-x| \geq 0 \quad |2-x| \leq 4 \quad -4 \leq 2-x \leq 4$
 $-6 \leq -x \leq 2 \rightarrow -2 \leq x \leq 6 \quad D_x = [-2, 6]$

~~Exercise~~ a) ① $1-x^r \geq 0$ $x^r \leq 1$ $-1 \leq x \leq 1 \rightarrow 0 \leq x \leq 1$
 $x \geq 0$

② $x \leq 0 \rightarrow 1+x^r \geq 0 \rightarrow x \in \mathbb{R} \Rightarrow \textcircled{1} \cap \textcircled{2} \Rightarrow D_x = (-\infty, 1]$

b) $r|x-a| \geq 0$ $|x-a| \leq r$ $-r \leq x-a \leq r$ $r \leq x \leq r+a$

$r-|x-a| \neq 1$ $|x-a| \neq r$ $x \neq r$ $x \neq r+a$ $D_x = [r, r+a] - \{r, r+a\}$

$\cos x \neq 0$ $x \neq k\pi + \frac{\pi}{2}$ $D_x = \{k\pi + \frac{\pi}{2} \mid k \in \mathbb{Z}\}$

b) $r \cos x - 1 \neq 0$ $\cos x \neq \frac{1}{r}$

$x \neq r k \pi \pm \frac{\pi}{r}$ $D_x = \{r k \pi \pm \frac{\pi}{r} \mid k \in \mathbb{Z}\}$

a) $(rx+1)^r \neq (x+r)^r$ $r x^{r+1} + r x \neq x^{r+1} + r + r x$

$r x^r - r x - 1 \neq 0$ $x^r - r x - r \neq 0$ $(x-r)(x+r) \neq 0$
 $x = r$ $x = -r$ $D_x = \mathbb{R} - \{r, -r\}$

b) $|rx+1| \geq |x+r|$ $(rx+1)^r \geq (x+r)^r$ $r x^r - r x - 1 \geq 0$
 $(x+\frac{r}{r})(x-r) \geq 0$ $\frac{-\frac{r}{r}}{\pm \frac{r}{r} - \frac{r}{r}}$ $D_x = (-\infty, -\frac{r}{r}] \cup [r, +\infty)$

① $rx-1 > 0$ $x > \frac{1}{r}$

② $\log_a^{rx-1} > 0$ $rx-1 > 1$ $x > 1$

③ $\log_{\frac{1}{r}} \log_a^{rx-1} \geq 0$ $\log_a^{rx-1} \leq 1$ $rx-1 \leq a$ $x \leq \frac{a+1}{r}$
 $1 < x \leq \frac{a+1}{r}$

① $r \cos x + 1 > 0$ $\cos x > -\frac{1}{r}$ $D_x = (rk\pi - \frac{r\pi}{r}, rk\pi + \frac{r\pi}{r})$ (a)

~~Exercise~~

① $\frac{x-1}{x+1} > 0$ $\frac{-1}{\frac{1}{x+1} - \frac{1}{x+1}}$

$\Rightarrow \textcircled{1} \cap \textcircled{2} \Rightarrow x < -1 = (-\infty, -1)$ (b)

② $\log \frac{x-1}{x+1} > 0$ $\frac{x-1}{x+1} > 1$ $\frac{-1}{x+1} > 0$

$x+1 < 0$ $x < -1$