

اگر x زوج باشد $x = 2k$ و اگر x فرد باشد $x = 2k+1$

$$x \begin{cases} 2k-1 & x \geq 0 \\ -2k & x < 0 \end{cases} \rightarrow x \geq 0 \rightarrow x = 2k \rightarrow x \geq 0 \rightarrow x = 2k \rightarrow x \geq 0 \rightarrow x = 2k$$

$f(x) \neq 0 \rightarrow x \notin \{-2, -1, 0, 1, 2\}$

$f(x-2) = 0 \rightarrow x = \{-2, 0, 2, 4, 6\}$

$D = (-2, -1] \cup [0, 2) \cup [4, \infty)$

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

$D = \mathbb{R} - \{0, 2\}$

3) $f(x) \geq 0 \rightarrow x^2 - 3x + 2 \geq 0 \rightarrow (x-1)(x-2) \geq 0 \rightarrow x \leq 1 \text{ or } x \geq 2$

$D = (-\infty, 1] \cup [2, \infty)$

1) $x^2 - 2x - 1 = (x^2 - 4) + (2x - 1) = (x-2)(x+2) + (2x-1)$

$\frac{x-2}{(x-2)(x+2)(x^2+2)} = \frac{1}{(x+2)(x^2+2)} \Rightarrow \frac{-1}{x+2} + \frac{1}{x^2+2}$

$D = (-\infty, \infty) - \{-2\}$

2) $\frac{x^2+1}{x^2-2} \geq 0 \rightarrow x^2+1 \geq 0 \rightarrow x^2 \geq -1 \rightarrow x \in \mathbb{R}$

$D = \mathbb{R} - \{-2\} = (-\infty, -2) \cup (-2, \infty)$

1) $\sqrt{x(x-1)(x+1)} \geq 0 \rightarrow x(x-1)(x+1) \geq 0 \rightarrow x \geq 0 \text{ or } x \leq -1$

$D_1 = [0, \infty) \cup (-\infty, -1]$

2) $|x-2| - x^2 \geq 0 \rightarrow |x-2| \geq x^2 \rightarrow x-2 \geq x^2 \text{ or } x-2 \leq -x^2$

$x-2 \geq x^2 \rightarrow x^2 - x + 2 \leq 0 \rightarrow (x+2)(x-1) \leq 0 \rightarrow D_2 = [-2, 1]$

$x-2 \leq -x^2 \rightarrow x^2 + x - 2 \leq 0 \rightarrow (x+2)(x-1) \leq 0 \rightarrow D_3 = [-2, 1]$

$D = D_1 \cap D_2 \cap D_3 = [-2, 1] \cup (-\infty, -1] = (-\infty, 1]$

$$x^r) \sqrt{(x-r)[x-r]} + \frac{r}{x} \circ \frac{r}{x} + D = \mathbb{R}$$

$$\sqrt{(x-1)[x-r]} - \frac{1}{x} - \frac{r}{x} \circ \frac{r}{x} + D = [r, \infty) \cup \{1\}$$

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$$\frac{1}{|x-r|-1} - k \neq 0 \quad |x-r|-1 \neq \pm k \quad \rightarrow k < 0 \quad \text{جواب}$$

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$$|x-r| \neq \pm k+1 \quad \begin{cases} k > 1 & \text{جواب} \\ k \leq 1 & \text{جواب} \checkmark \\ 0 < k < 1 & \text{جواب} \end{cases} \rightarrow k=0 \quad \text{جواب}$$

(KSI)

$$\frac{x^r + r^n + r}{x^r + r^{n+1}} \quad x^r + r^n + r = (x+1)(n+r)$$

$$D = \mathbb{R} - \{1, -1, -r\} \rightarrow n=r$$

$$\frac{n+1}{n-1} \quad \frac{x+1}{x-1} \neq 0 \rightarrow x \neq -1$$

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$$1, 2, \frac{1}{r} > 0 \quad 0 < x < 1 \quad (1)$$

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$$1, 2, \frac{1}{x+1} \rightarrow x+1 > 0 \rightarrow x > -1 \quad (2) \quad x+1 \neq 1 \Rightarrow x \neq 0 \quad (3)$$

$$1, 2, 3 \rightarrow D = (0, 1)$$

$$-1 \leq x^r - 1 \leq r \rightarrow -r \leq x^r \leq r \rightarrow 0 \leq x^r \leq r \rightarrow 0 \leq x^r \leq \frac{r}{x}$$

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

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