

تلف ۳

به نام خدا»

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$$1- \text{الف) } \frac{x+3}{2x^3+3x^2-11x+3} = \frac{x+3}{(x-1)(2x^2+5x-3)} \rightarrow$$

$x^2+5x-6, (x+6)(x-1), x < \frac{1}{2}$

$$\rightarrow (x-1)(2x^2+5x-3) \neq 0$$

$$\rightarrow \text{pf: } R - \left\{-3, \frac{1}{2}, 1\right\} \rightarrow x \neq -3, \frac{1}{2}, 1$$

$$\text{ب) } \frac{x+3}{2x^3+9x^2+10x+3} \rightarrow (x+1)(2x^2+7x+3) \neq 0$$

$$x^2+7x+3=0 \rightarrow (x+4)(x+1), x < \frac{-7}{2} = -3.5$$

$\frac{-1}{2} = -0.5$

$$\rightarrow x \neq -1, -3, -\frac{1}{2} \rightarrow \text{pf: } R - \left\{-1, -3, -\frac{1}{2}\right\}$$

$$2- \text{الف) } \frac{x+3}{x^3-2x^2+2x-1} \rightarrow x^3-2x^2+2x-1 \neq 0$$

$$\rightarrow (x-1)(x^2-x+1) \neq 0, x \neq 1, \text{pf: } R - \{1\}$$

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$$\text{ب) } \frac{x+3}{x^3-2x^2+2x-1} \rightarrow \frac{x+3}{(x-1)(x^2-x+1)} > 0$$

$$\rightarrow \frac{-3}{+} \frac{1}{+} \rightarrow \text{pf: } (-\infty, -3] \cup [1, +\infty)$$

$$g. \frac{\gamma}{x^2 - \Delta |x-1| - \gamma x + \Delta}$$

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$$x > 0 \rightarrow x^2 - \Delta x + \Delta - \gamma x + \Delta \neq 0 \rightarrow x^2 - \gamma x + 2\Delta \neq 0 \rightarrow (x-\gamma)(x-\Delta) \neq 0 \rightarrow x \neq \gamma, \Delta$$

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

$$pf: R - \{\gamma, \Delta, 0, -\gamma\}$$

$$الف) [-x] - \gamma \geq 0 \rightarrow [-x] \geq \gamma \rightarrow (-\infty, -\gamma]$$

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$$ب) \frac{\Delta x^2 + \gamma}{[x]^2 - \gamma[x] - \gamma} \rightarrow [x]^2 - \gamma[x] - \gamma \neq 0$$

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

$$\rightarrow x \neq (-\gamma, -1] \cup [\gamma, \gamma) \rightarrow pf: R - [(-\gamma, -1] \cup [\gamma, \gamma)]$$

$$الـ) g. \sqrt{[x - \frac{1}{\gamma}] + [x + \frac{\gamma}{\gamma}]} \rightarrow \sqrt{[x - \frac{1}{\gamma}] + [x + \frac{\gamma}{\gamma} - 1] + 1} \quad \Delta$$

$$\rightarrow \sqrt{\gamma[x - \frac{1}{\gamma}] + 1} \rightarrow \gamma[x - \frac{1}{\gamma}] + 1 \geq 0$$

$$\rightarrow [x - \frac{1}{\gamma}] \geq -\frac{1}{\gamma} \rightarrow [x - \frac{1}{\gamma}] \geq 0 \rightarrow x \geq \frac{1}{\gamma} \rightarrow pf: [\frac{1}{\gamma}, +\infty)$$

$$ب) g. \sqrt{[x - \frac{1}{\gamma}] + [x + \frac{1}{\gamma}]} \rightarrow g. \sqrt{[+1] + [-1]} \rightarrow [1] + [-1] \geq 0$$

$$\rightarrow t \in \mathbb{Z} \rightarrow x - \frac{1}{\gamma} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{\gamma}$$

$$t \in \mathbb{Z} \rightarrow x + \frac{1}{\gamma} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} - \frac{1}{\gamma}$$

$$pf: \{x + \frac{1}{\gamma} \mid x \in \mathbb{Z}\}$$

$$3) y, \frac{\cot x + 1}{\tan x + 1} \rightarrow \cot x \rightarrow x \neq \pi, \pi$$

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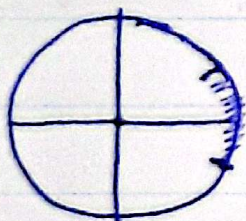
$$\tan x \rightarrow x \neq \frac{\pi}{2}, \frac{3\pi}{2}$$

$$\tan x + 1 \neq 0 \rightarrow \tan x \neq -1 \rightarrow x \neq \frac{3\pi}{4}, \frac{5\pi}{4}$$

$$\text{Def. } R = \left\{ \pi, \pi, \frac{\pi}{2}, \frac{3\pi}{2}, \frac{3\pi}{4}, \frac{5\pi}{4} \right\}$$

$$4) y, \sqrt{1 - r \sin^2 x} \rightarrow 1 - r \sin^2 x \geq 0 \rightarrow 1 \geq r \sin^2 x$$

$$\rightarrow \frac{1}{r} \geq \sin^2 x \rightarrow \frac{1}{r} \geq \sin x \quad \sin x \leq \frac{1}{r}$$



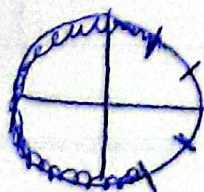
$$\text{Def. } \left[\pi/4, \pi/4 + \frac{\pi}{2} \right]$$

$$5) y, \sqrt{r \sin x - 1} \rightarrow r \sin x - 1 \geq 0 \rightarrow r \sin x \geq 1 \quad -5$$

$$\rightarrow \sin x \geq \frac{1}{r} \rightarrow \text{Def. } \left[\pi/4 + \frac{\pi}{2}, \pi/4 + \frac{3\pi}{2} \right]$$

$$6) y, \sqrt{1 - r \cos x} \rightarrow 1 - r \cos x \geq 0 \rightarrow 1 \geq r \cos x$$

$$\rightarrow \frac{1}{r} \geq \cos x \rightarrow \text{Def. } \left[\pi/4 + \frac{\pi}{2}, \pi/4 + \frac{3\pi}{2} \right]$$



Date

Subject

الف) $y = \arcsin(x^r + rx + 1) \rightarrow x^r + rx + 1 \leq 1 \quad - \Delta$

$$\rightarrow 0 \leq x^r + rx + 1 \rightarrow 0 \leq (x+r)(x+1) \quad \frac{x| - r - 1}{+ \quad - \quad +}$$

$$x^r + rx \leq 0 \rightarrow x(x+r) \leq 0 \quad \frac{x| - r}{+ \quad - \quad +}$$

$$Df: ((-\infty, -r] \cup [-1, +\infty)) \cap [-r, 0], [-r, -r] \cup [-1, 0]$$

ب) $\cos y = \sqrt{4-2x} \rightarrow -1 \leq \sqrt{4-2x} \rightarrow 0 \leq \sqrt{4-2x}$

$$\rightarrow 0 \leq 4-2x \rightarrow 2x \leq 4 \rightarrow x \leq 2, 4$$

$$\sqrt{4-2x} \leq 1 \rightarrow 4-2x \leq 1 \rightarrow 3 \leq 2x \rightarrow 1.5 \leq x$$

$$Df: [1.5, 2, 4]$$

الف) $\log_r (1 - \log_r x)$ $\rightarrow 1 - \log_r x > 0$ 9

$$\rightarrow 1 > \log_r x \rightarrow r > x, \quad x > 0 \rightarrow Df: (0, r)$$

$$\text{---)} \log_r (1 - \log_{\frac{1}{r}} x) \rightarrow 1 - \log_{\frac{1}{r}} x > 0 \rightarrow 1 > \log_{\frac{1}{r}} x$$

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$$\rightarrow \frac{1}{r} < x \rightarrow \boxed{Df \subset \mathbb{Q} \left(\frac{1}{r}, +\infty \right)}$$

$$x > 0$$

الف) $y_s \sqrt{\frac{r^n - n^r}{r - 1}}$ $\frac{r^n - n^r}{r - 1} \geq 0$

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$$\rightarrow \frac{r^n - n^r}{r - 1} \geq 0, \quad \frac{r^n - n^r}{r - 1} \geq 0 \Rightarrow n^r - r^n + r$$

$$\rightarrow \Rightarrow (n-r)(n-1), \quad \frac{n-1}{+} \frac{1}{-} \frac{r}{+} \quad \text{DF} \in [1, r]$$

ب) $y_s \left(\frac{r^n + \Delta}{r^n + r} \right) ! \rightarrow \frac{r^n + \Delta}{r^n + r} \in W$

$$\rightarrow n \in -\frac{rW - \Delta}{rW - r} \rightarrow n \in \frac{-rW + \Delta}{rW - r}$$

$$\rightarrow \text{DF} = \left\{ \frac{-rK + \Delta}{rK - r} \mid K \in W \right\}$$