

المركبة / دالة حقيقية / دالة حقيقية

$x^3 - x \neq 0 \rightarrow x^3 \neq x \rightarrow x \neq 0$

1, 2, 3

①

ا) $y = \sqrt{\frac{x^2 - 4x}{x^3 - x}} \Rightarrow \frac{x^2 - 4x}{x^3 - x} \geq 0 \rightarrow \frac{x^2 - 4x}{x^2 - 1} \geq 0 \rightarrow \frac{x(x-4)}{(x-1)(x+1)} \geq 0$

$D_f = (-1, 0) \cup [4, +\infty)$

ب) $y = \sqrt{\frac{x^4 - x^2}{x^3 - x}} \rightarrow \frac{x^4 - x^2}{x^3 - x} \geq 0 \rightarrow \frac{x^2(x^2 - 1)}{x^2(x - 1)} \geq 0 \rightarrow \frac{x^2 - 1}{x - 1} \geq 0$

$D_f = (-\infty, -1) \cup (-1, 0) \cup (0, 1) \cup (1, +\infty)$

②

ج) $y = \frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| > 0 \rightarrow \mathbb{R}^+$

$D_f = (0, +\infty)$

د) $y = \frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \rightarrow \mathbb{R}^+$

$D_f = (0, +\infty)$

③

هـ) $y = \sqrt{2 - [x]} \rightarrow 2 - [x] \geq 0 \rightarrow [x] \leq 2$

$D_f = (-\infty, 3)$

و) $y = \frac{1}{\sqrt{2 - [x]}} \rightarrow 2 - [x] > 0 \rightarrow [x] < 2$

$D_f = (-\infty, 2)$

④

ز) $y = \sqrt{[x - \frac{1}{x}] + [x + \frac{1}{x}]} \Rightarrow [x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 0 \rightarrow [2x] - 1 + [x + \frac{1}{x}] \geq 0$

③ $x[x + \frac{1}{x}] \geq 1 \rightarrow [x + \frac{1}{x}] \geq \frac{1}{x} \rightarrow x + \frac{1}{x} \geq 1 \rightarrow x \geq \frac{1}{x} \rightarrow D_f = [\frac{1}{x}, +\infty)$

ح) $\sqrt{[x - \frac{1}{x}] + [-x + \frac{1}{x}]} \Rightarrow [x - \frac{1}{x}] + [-x + \frac{1}{x}] \geq 0 \rightarrow [x - \frac{1}{x}] - [x - \frac{1}{x}] \geq 0 \rightarrow 0 \geq 0$

$D_f = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

⑤

ط) $y = \frac{x}{\sin x - 1} \neq 0 \rightarrow \sin x \neq 1$

$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ث) $y = \frac{x}{x \sin^2 x - 1} \neq 0 \rightarrow x \sin^2 x \neq 1$

$D_f = \mathbb{R} - \{\frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \dots\}$



$\frac{1}{x} \neq \sin x$

⑥

ج) $y = \sqrt{x \sin x - 1}$



$D_f = [k\pi, (k+1)\pi]$

د) $y = \sqrt{\cos x - 1}$



$D_f = [2k\pi, (2k+1)\pi]$

حل) $\cos y = |x| - 3 \rightarrow -1 \leq |x| - 3 \leq 1$
 $2 \leq |x| \leq 4 \rightarrow x \leq -2 \leq x \leq 4$
 $D_f = [-2, -1] \cup [1, 2]$

1, 1, 1

حل) $y = \arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1$ ✓
 ① $x^2 + 3x + 1 \geq 0$
 $-1 \leq x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x + 1 \geq 0$
 $x^2 + 3x + 1 \geq 0 \rightarrow x \leq -2$
 ② $x^2 + 3x + 1 \leq 1$
 $x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow x \geq -3$
 $D_f = [-3, -2] \cup [-1, 0]$

حل) $\sqrt{x - \log_p(x-2)}$ $x-2 > 0 \rightarrow x > 2$
 $x - \log_p(x-2) \geq 0 \rightarrow \log_p(x-2) \leq x$
 $D_f = (2, 11]$
 ① ✓

حل) $\log(x^2 - 2x)$ $x^2 - 2x > 0$
 $x(x-2) > 0 \rightarrow x < 0 \vee x > 2$
 $D_f = (-\infty, 0) \cup (2, \infty)$

حل) $y = \frac{x}{x^2 + 1} \rightarrow D_f = \mathbb{R}$

حل) $y = \frac{x}{x^2 - 1} \rightarrow D_f = \mathbb{R} - \{0\}$

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حل) $y = (x+1)!$
 $x+1 \in \mathbb{N}$
 $x \in \mathbb{N} - 1$
 $D_f = \{x \mid x = k-1, k \in \mathbb{N}\}$

حل) $y = \left(\frac{x-2}{x^2-1}\right)!$ $\frac{x-2}{x^2-1} \in \mathbb{N}$
 $D_f = \{x \mid x = \frac{aw+r}{rw-r}, k \in \mathbb{N}\}$