

نام و نام خانوادگی: ... با شماره دانشجویی: ... با شماره تلفن: ... کلاس: ...

الف) $y = \sqrt{\frac{x^2-4x}{x^2-x}}$ $\frac{x^2-4x}{x^2-x} \geq 0 \rightarrow \frac{x(x-4)}{x(x-1)} \geq 0 \rightarrow \frac{x-4}{x-1} \geq 0$ $D_f = (-\infty, 1) \cup (4, +\infty)$

ب) $y = \sqrt{\frac{x^2-2x}{x^2-x}}$ $\frac{x^2-2x}{x^2-x} \geq 0 \rightarrow \frac{x(x-2)}{x(x-1)} \geq 0 \rightarrow \frac{x-2}{x-1} \geq 0$ $D_f = (-\infty, 1) \cup (2, +\infty)$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ $\rightarrow x+|x| > 0 \rightarrow |x| > -x$ $D_f = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{x|x|}}$ $\rightarrow x|x| > 0$ $D_f = (0, +\infty)$

الف) $y = \sqrt{2-[x]}$ $\rightarrow 2-[x] \geq 0 \rightarrow [x] \leq 2$ $D_f = (-\infty, 2]$

ب) $y = \frac{1}{\sqrt{2-[x]}}$ $\rightarrow 2-[x] > 0 \rightarrow [x] < 2$ $D_f = (-\infty, 2)$

الف) $y = \sqrt{[x-\frac{1}{2}] + [x+\frac{2}{3}]}$ $\rightarrow [x-\frac{1}{2}] + [x+\frac{2}{3}] + 1 \geq 0$ $\rightarrow 2[x-\frac{1}{2}] \geq -1 \rightarrow [x-\frac{1}{2}] \geq -\frac{1}{2}$ $\rightarrow x-\frac{1}{2} \geq 0 \rightarrow x \geq \frac{1}{2}$ $D_f = [\frac{1}{2}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{3}] + [-x+\frac{1}{3}]}$ $\rightarrow [x-\frac{1}{3}] + [-(x-\frac{1}{3})] \geq 0$ $\Rightarrow x-\frac{1}{3} \in \mathbb{Z} \rightarrow D_f = \{x | x = t + \frac{1}{3}, t \in \mathbb{Z}\}$

الف) $y = \frac{2}{\sin x - 1}$ $\rightarrow \sin x \neq 1$ $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ب) $y = \sqrt{\cos x - 1}$ $\rightarrow \cos x \geq 1$ $D_f = \{2k\pi\}$

★ قسمت ب در سوال ۶ با قسمت ب در سوال ۵ جایگزین شود.

الف) $\sqrt{r \sin \theta - 1} \rightarrow r \sin \theta \geq 1 \rightarrow \sin \theta \geq \frac{1}{r}$  $D_f = \{k\pi + \pi\} - \{k\pi\}$

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ب) $\frac{r}{r \sin^2 \theta - 1} \rightarrow r \sin^2 \theta - 1 \neq 0 \rightarrow r \sin^2 \theta \neq 1 \rightarrow \sin^2 \theta \neq \frac{1}{r} \rightarrow \sin \theta \neq \pm \sqrt{\frac{1}{r}}$
 (سوال 5) $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{2}\}$ 

الف) $\cos y = |x| - r$ $-1 \leq |x| - r \leq 1 \rightarrow r \leq |x| \leq r+1$ $D_f = [r, r+1]$
 $[r, r+1]$ $[r, r+1] \cup [r+1, r+2]$

ب) $y = \arcsin(x^2 + r^{n+1}) \rightarrow -1 \leq x^2 + r^{n+1} \leq 1$ $D_f = (-r, -1] \cup [-1, 1]$
 $x^2 + r^{n+1} \leq 1 \rightarrow x^2 \leq 1 - r^{n+1}$
 $x^2 + r^{n+1} \geq -1 \rightarrow x^2 \geq -1 - r^{n+1}$
 الف) $y = \sqrt{x - \log_r(x-r)} \rightarrow x - r > 0 \rightarrow x > r$ $D_f = (r, 11]$
 $\log_r(x-r) \leq 2 \rightarrow x - r \leq 9 \Rightarrow x \leq 11$

ب) $\log(x^3 - x) \rightarrow x^3 - x > 0 \rightarrow x(x-1)(x+1) > 0$ $D_f = (-1, 0) \cup (1, +\infty)$

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

ب) $y = \frac{x}{x^2 - 1} \rightarrow x^2 - 1 \neq 0 \rightarrow x^2 \neq 1 \rightarrow x \neq \pm 1$ $D_f = \mathbb{R} - \{1, -1\}$

ج) $y = \frac{x}{x^2 - r} \rightarrow x^2 - r \neq 0 \rightarrow x^2 \neq r \rightarrow x \neq \pm \sqrt{r}$ $D_f = \mathbb{R} - \{\frac{1}{r}\}$

د) $y = \frac{x}{x^2 - r^2} \rightarrow x^2 - r^2 \neq 0 \rightarrow x^2 \neq r^2 \rightarrow x \neq \pm r$ $D_f = \mathbb{R} - \{r, -r\}$

الف) $y = (x+1)! \rightarrow x+1 \in \mathbb{N} \rightarrow x \in \mathbb{N} - 1$
 $\rightarrow \{n | n \in \frac{\mathbb{N}-1}{r}, x \in \mathbb{N}\}$

ب) $y = \left(\frac{x^2 - r}{x^2 - \delta}\right)! \rightarrow \frac{x^2 - r}{x^2 - \delta} \in \mathbb{N} \rightarrow x^2 - r \in \mathbb{N} \cdot (x^2 - \delta)$
 $x^2 - r = \mathbb{N} \cdot (x^2 - \delta)$
 $x^2 - r = \mathbb{N} \cdot x^2 - \mathbb{N} \cdot \delta$
 $x^2 - \mathbb{N} \cdot x^2 = r - \mathbb{N} \cdot \delta$
 $x^2(1 - \mathbb{N}) = r - \mathbb{N} \cdot \delta$
 $x^2 = \frac{r - \mathbb{N} \cdot \delta}{1 - \mathbb{N}}$
 $\{x | x \in \frac{r - \mathbb{N} \cdot \delta}{1 - \mathbb{N}}, x \in \mathbb{N}\}$