

الف) $\frac{x^2-4x}{x^2-21} \geq 0$ $\frac{x(x-4)}{x(x^2-1)}$ $DP = (-1, 0) \cup (0, 4) \cup (4, +\infty)$ -1 0 4 $-$ $+$ $-$ $+$ ✓	ب) $\frac{x^3-x^2}{x^2-x} \geq 0$ $\frac{x^2(x-1)}{x(x^2-1)} \geq 0 \rightarrow x^2 \geq 0$ $\frac{1}{x(x^2-1)}$ $DP = \mathbb{R} - \{1, 0, -1\}$ ✓
الف) $\frac{x+1}{\sqrt{x+ x }}$ $DP = (0, +\infty)$ $x < 0: x+ x = 0$ ✓	ب) $\frac{1}{\sqrt{x+ x }} > 0 \rightarrow x > 0$ $DP = (0, +\infty)$
الف) $\sqrt{2-[x]}$ $2-[x] > 0 \rightarrow [x] < 2 \rightarrow x < 3$ $DP = (-\infty, 3)$ ✓	ب) $\frac{1}{\sqrt{2-[x]}}$ $2-[x] > 0 \rightarrow [x] < 2 \rightarrow x < 3$ $DP = (-\infty, 2)$
الف) $y = \sqrt{[x-\frac{1}{2}] + [x+\frac{1}{2}]} \geq 0$ $x \geq \frac{1}{2}$ $DP = [\frac{1}{2}, +\infty)$ ✓	ب) $y = \sqrt{[x-\frac{1}{2}] + [x+\frac{1}{2}]}$ $[a] + [-a] = 0$ $x - \frac{1}{2} = n$ $DP = \{n + \frac{1}{2} n \in \mathbb{Z}\}$
الف) $\frac{1}{\sin x - 1}$ $\sin x \neq -1$ $DP = \mathbb{R} - \{2k\pi + \frac{3\pi}{2} k \in \mathbb{Z}\}$ ✓	ب) $\frac{1}{1 \sin x - 1}$ $\sin x \neq \frac{1}{1} \rightarrow \frac{1}{1}$ $DP = - \{ \frac{k\pi}{2} + \frac{\pi}{2} k \in \mathbb{Z} \}$

الف) $\sqrt{2\sin u - 1}$

$2\sin u - 1 \geq 0$

$\sin u \geq \frac{1}{2}$

Ⓢ ✓

$DP = [2K\pi + \frac{\pi}{6}, 2K\pi + \frac{5\pi}{6}]$

ب) $\sqrt{\cos u - 1}$

$\cos u \geq 1$

$\cos u = 1$

$DP = [2K\pi]$

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الف) $\cos y = |x| - 3$

$-1 \leq \cos y \leq 1 \rightarrow 2 \leq |x| \leq 4$ ١,٧٥

$DP = [-4, -2] \cup [2, 4]$

جدول تغییر علامت

$\frac{-2 \quad -1}{+ \quad - \quad - \quad +}$

ب) $\arcsin(u^2 + 3u + 1)$

$-1 \leq u^2 + 3u + 1 \leq 1 \rightarrow u^2 + 3u \leq 0$

$u^2 + 3u + 2 \geq 0$

$-3 \leq u \leq 0$ ٢٧

$(u+1)(u+2)$
 $u \leq -2 \text{ or } u \geq -1$

$DP = [-3, -2] \cup [-1, 0]$

جدول تغییر علامت!

$\frac{-1 \quad 0 \quad 1}{- \quad + \quad - \quad +}$

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الف) $\sqrt{2 - \log_2(u-2)}$

$u-2 \geq 0$

$\log_2(u-2) \leq 2$

$2 \leq u-2 \leq 9$
 $4 \leq u \leq 11$

$DP = [4, 11]$

١,٧٥ $u(u-1)(u+1) \geq 0$

$DP = (-\infty, 0) \cup (1, \infty)$

الف) $y = \frac{3}{x^2 + 1}$

$DP = \mathbb{R}$

$x^2 + 1 \geq 0$

ب) $y = \frac{3}{x^2 - 1}$

$x^2 - 1 \neq 0$

$x \neq \pm 1 \rightarrow x \neq 0$

Ⓢ ✓

$DP = \mathbb{R} - \{0\}$

ج) $y = \frac{3}{x^2 - 2}$

$x^2 - 2 \neq 0 \rightarrow x^2 \neq 2 \rightarrow x \neq \pm \sqrt{2}$

$DP = \mathbb{R} - \{\pm \sqrt{2}\}$

د) $y = \frac{3}{x^2 - 3}$

$x^2 - 3 \neq 0 \rightarrow x^2 \neq 3 \rightarrow x \neq \pm \sqrt{3}$

$x \neq \pm \sqrt{3}$

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الف) $y = (x+1)!$

$x+1 \in \mathbb{N} \rightarrow x = \frac{n-1}{1}$

$DP = \left\{ \frac{k-1}{1} / k \in \mathbb{N} \right\}$

Ⓢ ✓

$\frac{ax+b}{cx+d} = y$
 $\rightarrow x = \frac{dy-b}{cy-a}$

$DP = \left\{ \frac{yK-r}{yK-r} / K \in \mathbb{N} \right\}$

ب) $y = \left(\frac{x-2}{x-1} \right)!$

$x \in \mathbb{N}$

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