

الف) $\frac{x^2 - 6x}{x^3 - x} \geq 0 \rightarrow x(x-6) = 0 \rightarrow x \leq 6$
 $\frac{x^3 - x}{x^3 - x} \geq 0 \rightarrow x(x-1)(x+1) = 0 \rightarrow x \leq 1$
 ب) $\frac{x^3 - x}{x^3 - x} \geq 0 \rightarrow x \neq 0 \text{ و } -1$
 $\frac{x^3 - x}{x^3 - x} \geq 0 \rightarrow x \neq 0 \text{ و } 1$
 $D_f = (-\infty, -1) \cup (0, 1) \cup [6, +\infty)$
 $D_f = \mathbb{R} - \{-1, 0, 1\}$

الف) $x + |x| > 0 \rightarrow x \neq 0 \text{ و } -/x = +$
 فقط اعداد + جواب می دهد
 $D_f = (0, +\infty)$

ب) $x|x| > 0 \rightarrow x \neq 0 \text{ و } -/x = +$
 فقط اعداد + جواب می دهد
 $D_f = (0, +\infty)$

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

ب) $2 - [x] > 0 \rightarrow [x] > 2 \rightarrow D_f = (2, \infty)$

الف) $x + \frac{1}{x} = x - \frac{1}{x} + 1 \rightarrow [x + \frac{1}{x}] = [x - \frac{1}{x}] + 1$
 $[x - \frac{1}{x}] + 1 \geq 0 \rightarrow D_f = [\frac{1}{x}, +\infty)$
 ب) عبارت تناقضی است پس هیچ شذی در هیچ جا نیست
 $D_f = \{n + \frac{1}{n} | n \in \mathbb{Z}\}$

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

ب) $1 \sin^2 x \neq 1 \rightarrow \sin^2 x \neq \frac{1}{4} \rightarrow \sin x \neq \pm \frac{1}{2}$
 $D_f = \mathbb{R} - \{\frac{\pi}{6} + k\pi, \frac{5\pi}{6} + k\pi\}$

$2\sin \alpha - 1 \geq 0 \rightarrow \sin \alpha \geq \frac{1}{2} \rightarrow Df = \left[\frac{\pi}{6} + 2k\pi, \frac{5\pi}{6} + 2k\pi \right]$ (الف)	6
$\cos \alpha - 1 \geq 0 \rightarrow \cos \alpha \geq 1 \rightarrow \cos \alpha = 1$ چون بیشترین مقدار $\cos \alpha = 1$ است $Df = \{2k\pi\}$ (ب)	7
$-1 \leq x \leq 1 \rightarrow 2 \leq x \leq 4 \rightarrow Df = [-4, -2] \cup [2, 4]$ (الف) جدول تغییر علامت $\frac{-2}{+} \quad \frac{-1}{-} \quad \frac{+}{+}$ $ x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0$ (ب) $x \leq -2$ یا $x \geq -1$ $x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow -3 \leq x \leq 0$ $x+2 > 0 \rightarrow 2 - \log(x-2) \geq 0 \rightarrow x-2 \leq 9 \rightarrow x \leq 11$ (الف) $\frac{-1}{-} \quad \frac{0}{+} \quad \frac{1}{-}$ $x^3 - x \geq 0 \rightarrow x(x-1)(x+1) \geq 0$ (ب) $Df = (-1, 0) \cup (1, +\infty)$	8
$f^x = 1 \neq 0 \rightarrow f^x \neq 1$ (ب) $f^0 = 1 \quad Df = \mathbb{R} - \{0\}$ (الف) $Df = \mathbb{R}$	9
$f^x \neq 2 \rightarrow x \neq \log_f 2$ (ب) $Df = \mathbb{R} - \{\log_f 2\}$	10
$fx + 1 = 0$ و $2, 3, 4, \dots \rightarrow fx = n \rightarrow x = \frac{n-1}{f}$ (الف) $\frac{fx+1 \in \mathbb{N} \rightarrow x \in \frac{\mathbb{N}-1}{f}}$ $Df = \left\{ \frac{n-1}{f} \mid n \in \mathbb{N} \right\}$ (ب) $\frac{fx-r}{fx-w} \in \mathbb{N}$ $fx-r = n(fx-w)$ $fx-r = fnx - wn$ $fx(1-n) = r - wn$ $x = \frac{r-wn}{f(1-n)}$ $Df = \left\{ \frac{r-wn}{f(1-n)} \mid n \in \mathbb{N} \right\}$	11