

الف $\frac{n(n-4)}{n(n-1)(n+1)} = \frac{n-4}{(n-1)(n+1)} \rightarrow D = (-1, 0) \cup (0, 1) \cup [4, \infty)$ 16, 18
جدول تعیین علامت

-1	0	1	4
$\frac{-}{+}$	$\frac{+}{+}$	$\frac{+}{+}$	$\frac{-}{+}$

$\rightarrow n \neq -1, 0, 1$
 $n^2 \geq 0 \quad \left\{ \mathbb{R} : \{-1, 0, 1\} \right.$ 18

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

ب $n + |n| > 0 \rightarrow 2n > 0$ (الف) $|n|n > 0$ (ب)
 $|n| = n \rightarrow n > 0$
 $n < 0 \rightarrow |n| = -n$
 $D = (0, \infty)$ 19 ✓

$n > 0 \rightarrow n^2 > 0$ ✓
 $n < 0 \rightarrow -n^2 < 0$
 $D = (0, \infty)$

ج $2 - [n] > 0 \rightarrow [n] < 2$ (الف) $2 - [n] \geq 0 \rightarrow [n] \leq 2$ (ب)
 $n < 2$
 $D = (-\infty, 2)$ 20 ✓

$n < 3$
 $D = (-\infty, 3)$

د $[n - \frac{1}{n}] + [n + \frac{1}{n}] \geq 0 \rightarrow [n - \frac{1}{n}] + [n - \frac{1}{n}] \geq -1$
 $2[n - \frac{1}{n}] \geq -1 \rightarrow [n - \frac{1}{n}] \geq -\frac{1}{2} \rightarrow n - \frac{1}{n} \geq -\frac{1}{2}$
 $n \geq \frac{1}{n}$
 $D = [\frac{1}{2}, +\infty)$

[n] + [-n] ∈ Z
 $n \leq n < n + \frac{1}{n}$ $n - \frac{1}{n} \in \mathbb{Z} \rightarrow n \in \mathbb{Z} + \frac{1}{n}$
 $[n - \frac{1}{n}] = \lfloor n - \frac{1}{n} \rfloor = \lfloor n \rfloor + \lfloor -\frac{1}{n} \rfloor = n + \lfloor -\frac{1}{n} \rfloor$
 $[-n + \frac{1}{n}] = -n$
 $n + \frac{1}{n} \leq n < n + 1 \cup [n + \frac{1}{n}, n + 1) \rightarrow n \in \mathbb{Z}$
 $[n - \frac{1}{n}] = n$ / $[n + \frac{1}{n}] = -n$ ✓

ه $2 \sin^2 n - 1 \neq 0$ (الف) $\sin n - 1 \neq 0$ (ب)
 $\sin^2 n \neq \frac{1}{2}$
 $\sin n \neq \pm \frac{\sqrt{2}}{2}$
 $n \neq \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4} + 2K\pi$ 21 ✓

$\sin n = 1$
 $n = \frac{\pi}{2} + 2K\pi$
 $D \Rightarrow \mathbb{R} \setminus \{ \frac{\pi}{2} + 2K\pi \}, K \in \mathbb{Z}$

$\cos x - 1 \geq 0$ $\cos x = 1$ $x = 2k\pi$ $D_f = \{2k\pi \mid k \in \mathbb{Z}\}$	$\cos x - 1 \geq 0$ (الف) $\sin x \geq \frac{1}{2}$ $x \in \left[\frac{\pi}{6} + 2k\pi, \frac{5\pi}{6} + 2k\pi\right]$	6
$-1 \leq x^2 + 3x + 1 < 1$ $x^2 + 3x \geq 0 \rightarrow x(x+3) \geq 0$ $x \geq 0 \quad \vee \quad x \leq -3$ $x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0$	$\cos y = \cos x - 3$ (الف) $-1 \leq x - 3 \leq 1$ $2 \leq x \leq 4$ $D_f = [-4, -2] \cup [2, 4]$	7
$x^2 - x > 0$ $x(x-1)(x+1) > 0$ $D_f = (-1, 0) \cup (1, +\infty)$	$x - 2 > 0 \rightarrow x > 2$ (الف) $2 - \log_2(x-2) \geq 0$ $\log_2(x-2) \leq 2$ $x - 2 \leq 4 \rightarrow x \leq 6$ $D_f = (2, 6]$	8
الف) $x^2 + 1 > 0 \rightarrow x^2 > -1 \rightarrow D_f = \mathbb{R}$ ب) $x^2 - 1 \neq 0 \rightarrow x^2 \neq 1 \rightarrow x \neq \pm 1 \rightarrow D_f = \mathbb{R} - \{\pm 1\}$ ج) $x^2 \neq 2 \rightarrow x \neq \pm \sqrt{2} \rightarrow D_f = \mathbb{R} - \{\pm \sqrt{2}\}$ د) $x^2 - 2 \neq 0 \rightarrow x^2 \neq 2 \rightarrow x \neq \pm \sqrt{2} \rightarrow D_f = \mathbb{R} - \{\pm \sqrt{2}\}$		9
$\frac{x^2 - 2}{x^2 - 4} = n \rightarrow (n = 0, 1, 2, \dots)$ $n \neq \frac{1}{2}$ $D_f = \mathbb{W}$	$x^2 + 1 \in \mathbb{W} \rightarrow (n = 0, 1, \dots)$ (الف) $x = \frac{n-1}{2} \rightarrow D_f = \left\{-\frac{1}{2}, \frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \dots\right\}$	

$$D_f = \{x \mid x = \frac{\Delta n - 2}{2n - 4}, n \in \mathbb{W}\}$$