

الف) $\frac{n+2}{2n^2-4n+3n-1} = \frac{n+2}{(n-1)(n-2)(n-1)}$

$D_f = IR - \left\{ 1, \frac{2}{3}, \frac{1}{2} \right\}$

ب) $\frac{n+3}{2n^2-4n-4n-4} = \frac{(n+3)}{(n+1)(2n^2-4n-4)}$

$D_f = IR - \left\{ -1, \frac{2}{3}, -\frac{1}{2} \right\}$

Handwritten calculations for rational functions and their domains, including factoring and solving for n.

الف) $n - \sqrt{3-2n} \neq 0 \Rightarrow n \neq \sqrt{3-2n} \Rightarrow n^2 \neq 3-2n \Rightarrow n^2+2n-3 \neq 0 \Rightarrow (n+3)(n-1) \neq 0$

$3-2n \geq 0 \Rightarrow -2n \geq -3 \Rightarrow 2n \leq 3 \Rightarrow n \leq \frac{3}{2}$

$D_f = (-\infty, \frac{3}{2}] - \{ -1, 1 \}$

ب) $n - \sqrt{3n-2} \neq 0 \Rightarrow n \neq \sqrt{3n-2} \Rightarrow n^2 \neq 3n-2 \Rightarrow n^2-3n+2 \neq 0 \Rightarrow (n-1)(n-2) \neq 0$

$3n-2 \geq 0 \Rightarrow 3n \geq 2 \Rightarrow n \geq \frac{2}{3}$ $D_f = [\frac{2}{3}, +\infty) - \{ 1, 2 \}$

الف) $2\cos n - 1 \neq 0 \Rightarrow 2\cos n \neq 1 \Rightarrow \cos n \neq \frac{1}{2} \Rightarrow n \neq \frac{\pi}{3}, \frac{5\pi}{3}$

$D_f = IR - \left\{ \frac{\pi}{3}, \frac{5\pi}{3} \right\}$

ب) $2\sin n + 1 \neq 0 \Rightarrow 2\sin n \neq -1 \Rightarrow \sin n \neq -\frac{1}{2} \Rightarrow n \neq \frac{7\pi}{6}, \frac{11\pi}{6}$

$D_f = IR - \left\{ \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$

ج) $\tan = \frac{\sin}{\cos} \Rightarrow \cos \neq 0 \Rightarrow \cot n \neq 1 \Rightarrow n \neq \frac{\pi}{4}, \frac{5\pi}{4}$

$D_f = IR - \left\{ \frac{\pi}{4}, \frac{5\pi}{4} \right\}$

د) $2\sin^2 n \neq 3 \Rightarrow \sin^2 n \neq \frac{3}{2} \Rightarrow \sin n \neq \pm \sqrt{\frac{3}{2}}$

$D_f = IR - \left\{ \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4} \right\}$

الف) $n^2 - 4n + 4 > 0 \Rightarrow (n-2)(n-2) > 0$

$\frac{+}{+} \frac{-}{-} \frac{+}{+}$

$D_f = (-\infty, 2) \cup (2, +\infty)$

ب) $n^2 - 4n + 4 \leq 0 \Rightarrow (n-2)(n-2) \leq 0$

$\frac{+}{+} \frac{-}{-} \frac{+}{+}$

$D_f = \{2\}$

ج) $n^2 + 4n + 4 > 0 \Rightarrow (n+2)(n+2) > 0$

$\frac{-}{-} \frac{+}{+} \frac{-}{-}$

$D_f = (-\infty, -2) \cup (-2, +\infty)$

د) $n^2 - 4n + 4 \leq 0 \Rightarrow (n-2)(n-2) \leq 0$

$\frac{+}{+} \frac{-}{-} \frac{+}{+}$

$D_f = \{2\}$

الف) $\frac{(n-1)(n-2)}{(n-2)} < 0$

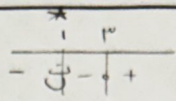
$\frac{+}{-} \frac{+}{+} \frac{-}{-}$

$D_f = (-\infty, 1) \cup (2, +\infty)$

ب) $\frac{(n+1)(n-1)}{(n-2)(n-1)} > 0$

$\frac{-}{+} \frac{+}{-} \frac{+}{+}$

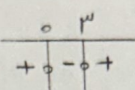
$D_f = (-1, 2) \cup (2, +\infty)$

الف) $\frac{(n-1)(n-3)}{(n-1)(n^2+1+n)} > 0$  $D_f = [3, +\infty)$
 (+) $\Delta < 0 \Rightarrow \Delta < 0 \Rightarrow$

(5)

ب) $n^2 - 1 \neq 0 \Rightarrow (n+1)(n-1) \neq 0 \Rightarrow n \neq \pm 1$ $D_f = \mathbb{R} - \{\pm 1\}$

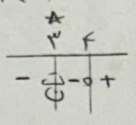
6

الف) $n^2 - 3n > 0 \Rightarrow n(n-3) > 0$  $D_f = (3, +\infty) \cup (-\infty, 0)$

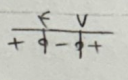
ب) $19 - n^2 > 0 \Rightarrow n^2 < 19 \Rightarrow -\sqrt{19} < n < \sqrt{19}$ (I)
 $|n| - 2 > 0 \Rightarrow |n| > 2 \Rightarrow n > 2$ (II) $|n| - 2 \neq 1 \Rightarrow |n| \neq 3 \Rightarrow n \neq \pm 3$ (III)
 $D_f = (\sqrt{19}, 3) \cup (-3, -\sqrt{19}) - \{\pm 3\}$

7

(5)

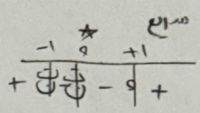
ج) $\frac{n^2 - 5n + 4}{n - 3} > 0$ $\frac{(n-4)(n-1)}{(n-3)} > 0$  $D_f = (4, +\infty) - \{3\}$

$10 - n > 0 \Rightarrow n < 10$ $10 - n \neq 1 \Rightarrow -n \neq -9 \Rightarrow n \neq 9$

د) $n^2 - 11n + 28 > 0 \Rightarrow (n-4)(n-7) > 0$  $D_f = (7, +\infty) \cup (-\infty, 4]$
 $n \neq 1$ $n > 0$ $34 - n^2 > 0 \Rightarrow n^2 < 34 \Rightarrow -\sqrt{34} < n < \sqrt{34}$
 $D_f = (0, 4] - \{1\}$

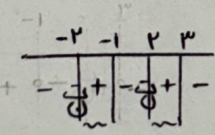
8

(5)

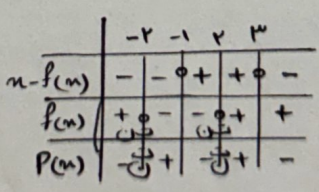
$y = \frac{n(n-1)}{n(n+1)}$ 
 : $\begin{matrix} -1 & 0 & 1 \\ + & + & - \\ + & - & + \end{matrix}$

نقاط حرجية

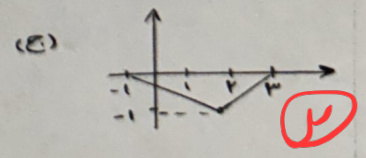
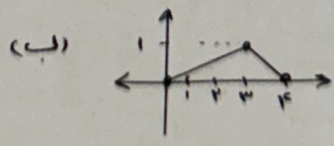
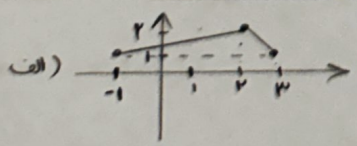
	-1	0	1
$n^2 - n$	+	+	-
$n^2 + n$	+	-	+
$P(n)$	+	-	+

الف) $x = f(n) \Rightarrow x = 3, -1$  $D_f = (-3, -1] \cup (3, 3]$
 $f(n) = 0 \Rightarrow n \neq \pm 2$

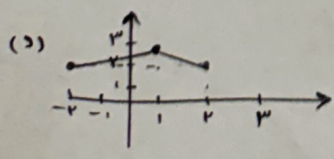
(5)

$f(n) \neq 0 \Rightarrow n \neq \pm 2$
 $\frac{x - f(n)}{f(n)} > 0$ 

9



(5)



10