

$$n = \begin{cases} y-1 & y \geq 0 \rightarrow \frac{n+1}{2} = y \\ -y & y > 1 \rightarrow -n = y^2 \end{cases}$$

$$\frac{n+1}{2} \geq \frac{-1}{-1+}$$

$$y = \sqrt{-n} > 1 \quad \text{نکته } n < -1$$

۱- $n > -1 \rightarrow$...
 $n < -1 \rightarrow$...
 $n = -1 \rightarrow y = 0$...

$f(n) = 0 \rightarrow n = -1, 3, 5$

$n = 0$

$f(n-2) =$
 $n-2 = -1 \rightarrow n = -1$
 $n-2 = 3 \rightarrow n = 5$
 $n-2 = 5 \rightarrow n = 7$

-1	-2	0	3	5	7
-	+	-	+	-	+

$(-1, -2] \cup [0, 3) \cup [7, +\infty)$...
 $f(n-2) \rightarrow$...

$f(n) = \frac{f(n^2) - f(n+2)}{n^2 - 2n}$

$n^2 - 2n \neq 0$

$n(n-2)(n+2) \neq 0 \rightarrow \{2, -2, 2\} = f(n)$

$\sqrt{\frac{f(n^2) - f(n+2)}{n^2 - 2n}} \geq 0$
 $\rightarrow -2, 2$

$A: f(n^2) - f(n+2)$

$\Delta = 9 - 4 \times 2 \times 2 = 9 - 16 \rightarrow \Delta < 0$

چون a مثبت است پس جواب مثبت است

$\frac{-2}{-} + \frac{2}{-} + \frac{2}{-} + 1 \quad D_f = (-2, 0) \cup (2, +\infty)$

ب) $\sqrt{f(n)}$

الف) $y = \sqrt{\frac{n-2}{n^2 - 2n - 1}}$

$\sqrt{\frac{n-2}{(n^2-2)(n^2+2)}} = \sqrt{\frac{n-2}{(n-2)(n+2)(n^2+2)}}$

$\frac{-2}{-} + \frac{2}{-} + \frac{2}{-}$
 $D_f = (-2, +\infty) - \{2\}$

ب) $y = \frac{f(n^2+1)}{2 - f(-n)}$

$f \neq 2[-n] \quad f \neq [-n]$

$f_1 - n f_2 \quad -2 \geq n > -3$

$D_f = \{2, -1, -2\}$

الف) $f(n) = \frac{\sqrt{n(n^2-1)}}{n(n-1)(n+1)} \geq 0$
 $\sqrt{n(n^2-1)} \geq 0 \rightarrow n(n-1)(n+1) \geq 0$
 $\sqrt{n(n^2-1)} \geq 0 \rightarrow n(n-1)(n+1) \geq 0$
 $\sqrt{n(n^2-1)} \geq 0 \rightarrow n(n-1)(n+1) \geq 0$

ب) $f(n) = \frac{\sqrt{n(n^2-1)}}{n(n-1)(n+1)}$

$n \geq 2 \rightarrow -n^2 + n - 2 \geq 0$

$n \leq -2 \rightarrow -n^2 - n + 2 \geq 0$

$\Delta = 1 - 4 \times 2 \times (-1) \Delta < 0 \rightarrow$

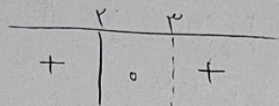
$\frac{-2}{+} + \frac{1}{+}$

$D_f = [-2, 1] - \{1\}$

$= [-2, 1) - \{1\}$

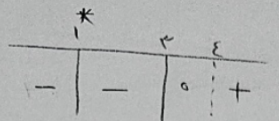
-4

الف) $y = \sqrt{(n-r)[n-r]} \geq 0$



$D_f = \mathbb{R}$

ب) $y = \sqrt{|n-1| [n-3]} \geq 0$

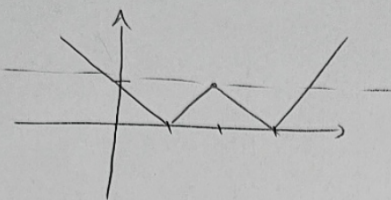


$D_f = \{1\} \cup [3, +\infty)$

-5

$| |n-2| - 1 | - k \neq 0$

$| |n-2| - 1 | \neq k$



$k=1$

$y=1$ منحنى قطع

-6

$$f(n) = \frac{n^2 + 3n + 2}{n^2 + 3n + 2} \cdot (n+1)(n+2) \neq 0 \Rightarrow n \neq -1, -2$$

$\mathbb{R} - \{-1, -2, +1\} \rightarrow n=3$

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

$n=2$ منحنى

$y = \log_{n+1} \frac{1}{n} \cdot \log \frac{1}{n}$

$n > -1 \Rightarrow n+1 \neq 1 \rightarrow n \neq 0$

$D_f = (0, 1)$

-7

$\log \frac{1}{n} > 0 \rightarrow$ منحنى قطع

$D_{f(n)} = [-2, 2]$

$f(3n^2-1)$

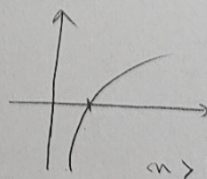
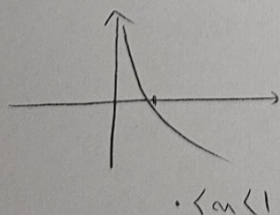
$-2 \leq 3n^2-1 \leq 2$

$-1 \leq 3n^2 \leq 3$

$n^2 \leq \frac{1}{3}$

$\rightarrow -\frac{\sqrt{3}}{3} \leq n \leq \frac{\sqrt{3}}{3}$

$D_f = \left[-\frac{\sqrt{3}}{3}, \frac{\sqrt{3}}{3}\right]$



المنحنى 9