

الف) $y = \frac{|n|+1}{|n|-2}$: $\begin{cases} +\infty & \frac{+\infty+1}{+\infty-2} = \frac{+\infty}{+\infty} = 1 \\ -\infty & \frac{-\infty+1}{-\infty-2} = \frac{-\infty}{-\infty} = 1 \end{cases}$

$\rightarrow$ مخرج می تواند صفر شود پس : $R_f = (-\infty, -\frac{1}{2}) \cup (1, +\infty)$

ب) $y = \frac{n^2+1}{|n|}$: $y = \frac{n^2}{|n|} + \frac{1}{|n|} = |n| + \frac{1}{|n|}$: $! \oplus$ اولی و دومی

$\hookrightarrow R_f = [2, +\infty)$

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$y = \frac{n^2+2n-2}{n+3}$: $(\text{مشتق اول}) \rightarrow y n + 3y = n^2+2n-2 \Rightarrow n^2+n(3-y)-(2+3y) = 0$

$\rightarrow n = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{y-3 \pm \sqrt{(y-3)^2+4(2+3y)}}{2}$: $\Delta \geq 0 : 4y^2-4y+1+12y \geq 0$

$\Rightarrow y^2+3y+1 \geq 0$

$\hookrightarrow (y+4)(y-1) \geq 0$: $\frac{-4}{+} \quad \frac{-1}{-}$

$\Rightarrow R_f = \mathbb{R} - (-2, -1) = (-\infty, -2] \cup [-1, +\infty)$

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$y = \frac{n^2-n+1}{n^2-n+1}$: $\Delta \geq 0$: $\Rightarrow \mathbb{R}$: $\Rightarrow D_f = \mathbb{R}$

$\hookrightarrow y = \frac{(n-\frac{1}{2})^2}{(n-\frac{1}{2})^2+\frac{3}{4}}$: $\begin{cases} +\infty & \frac{+\infty}{+\infty+\frac{3}{4}} = 1 \\ -\infty & \frac{-\infty}{-\infty+\frac{3}{4}} = 1 \end{cases}$

$(t = (n-\frac{1}{2})^2)$: $\Rightarrow R_f = [0, 1)$

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الف) $y = \sqrt{-n^2+4n-1}$: $\hookrightarrow \begin{cases} \frac{-b}{2a} : n_1 = \frac{4}{2} = 2 \\ \frac{-\Delta}{2a} : n_2 = -2+1-1 = -2 \end{cases}$

$\Rightarrow \sqrt{[-2, 2]} \Rightarrow R_f = [-2, \sqrt{2}]$

ب) $y = \sqrt[3]{n^2-1}$: $\hookrightarrow y_1 = \frac{-\Delta}{2a} = \frac{-2}{1} = -2$

$\Rightarrow \sqrt[3]{[-1, +\infty)} \Rightarrow R_f = [-2, +\infty)$

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الف) $y = \log(n^2-n+1)$: $\rightarrow \log \mathbb{R} = \log(0, +\infty)$

$\hookrightarrow R_f = \mathbb{R}$

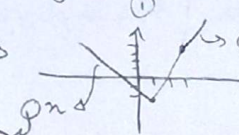
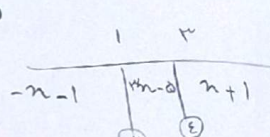
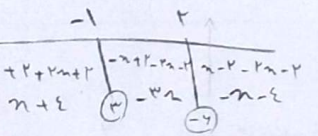
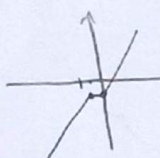
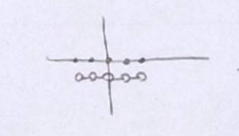
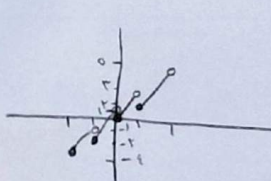
$\Rightarrow R_f = \mathbb{R} = (-\infty, +\infty)$

ب) $y = \log(\frac{n^2+1}{n})$: $\frac{n^2+1}{n} = n + \frac{1}{n}$

$\hookrightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

$\Rightarrow \log [2, +\infty)$: $\rightarrow R_f = [1, +\infty)$

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الف) $y = 2x-1 - x-3$:  $\Rightarrow R_f = [-\infty, +\infty)$ 	ب) $y = x-2 + x+1$:  $\Rightarrow R_f = [1, +\infty)$	6
$x-2 - 2 x+1 \leq 1$  $\begin{cases} 1) -x=1 \\ x=-1/2 \\ 2) x+1=1 \\ x=0 \end{cases}$ $\Rightarrow \text{المجال} =]R - (-\infty, -1/2) \cup (-\infty, 0] \cup [1/2, +\infty)$	$\Rightarrow \text{المجال} =]R - (-\infty, -1/2) \cup (-\infty, 0] \cup [1/2, +\infty)$	7
$y = x - x+1 + x-1$: $\Rightarrow x = -1$ $\Rightarrow x = -1/2$ $\Rightarrow x = 1$ $\Rightarrow R_f =]R$		8
ج) $y = [x] + [x-1] = [x] + [-x] + x$  $R_f = \{x, x\}$	$\Rightarrow y = x - [x]$ $\begin{cases} x \in [0, 1) \rightarrow y = x \\ x \in [1, 2) \rightarrow y = x-1 \\ x \in [2, 3) \rightarrow y = x-2 \\ x \in [3, 4) \rightarrow y = x-3 \end{cases}$  $R_f = [-1, 0)$	9
د) $y = \sin^2 x - \sin x + 1$: $\Rightarrow 1 - 1 + 1 = 1$ $\Rightarrow 1 + 1 + 1 = 3$ $\Rightarrow \frac{1}{2} - \frac{1}{2} + 1 = \frac{3}{2}$ $\Rightarrow R_f = [\frac{3}{2}, 3]$	$\Rightarrow y = \sin^2 x + \sin^2 x + 1$ $\Rightarrow 1 + 1 + 1 = 3$ $\Rightarrow \dots + 1 = 1$ $\Rightarrow R_f = [1, 3]$ $\sin^2 x \neq -1/2$	10