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

ب) $y = \frac{n^2+1}{|n|}$: $y = \frac{n^2}{|n|} + \frac{1}{|n|} = |n| + \frac{1}{|n|}$
: $\oplus$ اولی ∞ است

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

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

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

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

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

$\hookrightarrow (y+4)(y+2) \geq 0$: $\frac{-2}{+} \quad \frac{-4}{-}$

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$y = \frac{n^2-n+1}{n^2-n+1}$: $\Delta b^2 - 4ac$
 $(\Delta b^2 - 4ac) \rightarrow \begin{cases} \Delta b^2 - 4ac < 0 \Rightarrow \text{دو جواب ندارد} \\ \Delta b^2 - 4ac = 0 \Rightarrow \text{یک جواب دارد} \\ \Delta b^2 - 4ac > 0 \Rightarrow \text{دو جواب دارد} \end{cases} \Rightarrow D_f = \mathbb{R}$

$\hookrightarrow y = \frac{(n-\frac{1}{2})^2}{(n-\frac{1}{2})^2 + \frac{3}{4}}$: $\begin{cases} +\infty & \frac{+\infty}{+\infty + \frac{3}{4}} = 1 \\ -\infty & \frac{-\infty}{-\infty + \frac{3}{4}} = 1 \end{cases}$
 $(t = (n-\frac{1}{2})^2) \Rightarrow R_f = [0, 1)$

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الف) $y = \sqrt{-n^2 + 4n - 1}$: $\hookrightarrow \begin{cases} \frac{-b}{2a} : n_1 = \frac{2}{-2} = -1 \\ \frac{-b \pm \sqrt{\Delta}}{2a} : n_2 = \frac{4 \pm \sqrt{16-4}}{-2} = \frac{4 \pm \sqrt{12}}{-2} \end{cases}$
 $\frac{-b}{2a} \leq n \leq \frac{-b + \sqrt{\Delta}}{2a} \Rightarrow y_1 = -(-1) - 1 = 0$

ب) $y = \sqrt{n^2 - 4n}$: $\hookrightarrow y_1 = \frac{-\Delta}{2a} = \frac{-(-4)}{1} = 4$
 $\hookrightarrow \sqrt{[-1, +\infty)} \Rightarrow R_f = [4, +\infty)$

$\Rightarrow \sqrt{[-\infty, 0]} \Rightarrow R_f = [0, \sqrt{3}]$

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

ب) $y = \log(\frac{n^2+1}{n})$: $\frac{n^2+1}{n} = n + \frac{1}{n}$
 $R_f = (-\infty, 2] \cup [2, +\infty)$
 $\Rightarrow \log [2, +\infty) \rightarrow R_f = [1, +\infty)$

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الف) $y = x-1 - x-3$: $\hookrightarrow R_f = [-2, 2]$ $\hookrightarrow R_f = [-2, 2]$	ب) $y = x-2 + x+1$: $\hookrightarrow R_f = [-1, 3]$ ٢ ٦
$x-1 - 2 x+1 \leq 1$ $\hookrightarrow R_f = \mathbb{R}$ ٢ ٧	٢ ٧
$y = x - x+1 + 1$: $\hookrightarrow R_f = \mathbb{R}$ ٢ ٨	٢ ٨
ج) $y = [x] + [x-1] = [x] + [-x] + 1$ $\hookrightarrow R_f = \{1, 2\}$ ٢ ٩	$\hookrightarrow y = x - [x]$ $\hookrightarrow R_f = [-1, 1)$ ٢ ٩
د) $y = \sin^2 x - \sin x + 1$: $\hookrightarrow R_f = [\frac{3}{4}, 2]$ ٢ ١٠	$\hookrightarrow y = \sin^2 x + \sin^2 x + 1$ $\hookrightarrow R_f = [1, 3]$ ٢ ١٠