

الف) $\frac{|n|+1}{|n|-2}$ $\xrightarrow{n>0}$ $\frac{n+1}{n-2} \Rightarrow n=0$ $\xrightarrow{n<0}$ $\frac{-n+1}{-n-2}$

گراف $y = \frac{|x|+1}{|x|-2}$ را در نظر بگیرید. دایره های $x=2$ و $x=-2$ را به عنوان نقاط بحرانی در نظر بگیرید. دامنه ها: $(-\infty, -2) \cup (-2, 0) \cup (0, 2) \cup (2, +\infty)$. از آنجا که $x=0$ یک نقطه بحرانی است، آن را نیز در نظر بگیرید. دامنه نهایی: $\boxed{(-\infty, -\frac{1}{2}] \cup (1, +\infty)}$

ب) $|n| + \frac{1}{|n|}$ $\rightarrow R = [2, +\infty)$

$y = \frac{n^2+2n-2}{n+3} \Rightarrow yn + 3y = n^2+2n-2 \rightarrow n^2 + (3-y)n - 2 = 0 \Rightarrow \Delta \geq 0$

$\rightarrow (3-y)^2 + 8 = y^2 + 6y + 17 \geq 0 \Rightarrow y = \frac{-6 \pm \sqrt{36}}{2} = \frac{-6 \pm 6}{2} \Rightarrow \begin{cases} -4 \\ -2 \end{cases}$

$\frac{-4}{+1} - \frac{-2}{0} + \Rightarrow R = (-\infty, -4] \cup [-2, +\infty)$

$R(n) = \frac{n^2-n+\frac{1}{2}}{n^2-n+1} \rightarrow yn^2 - yn + y = n^2 - n + \frac{1}{2} \rightarrow (y-1)n^2 + (1-y)n + y - \frac{1}{2}$

$\rightarrow \Delta \geq 0 \Rightarrow (1-y)^2 - 4(1-y)(y-\frac{1}{2}) = y^2 + 1 - 2y - 4y^2 + 2y - 1 = -3y^2 + 2y$

$\rightarrow -3y^2 + 2y \geq 0 \rightarrow y(-3y+2) \Rightarrow \frac{0}{-1+1} \rightarrow R = [0, \frac{2}{3}]$

الف) $\sqrt{-n^2+4n-1} \rightarrow \text{ext} \Big|_n^1 \Rightarrow \sqrt{(-\infty, 2]} \Rightarrow R = [0, \sqrt{3}]$

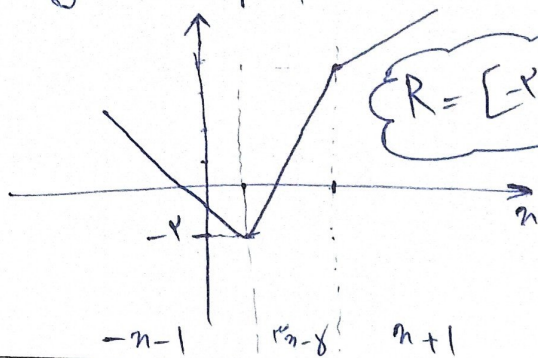
ب) $\sqrt[3]{2n^2-19n} \rightarrow \text{ext} \Big|_n^2 \Rightarrow \sqrt[3]{[-1, +\infty)} \Rightarrow R = [-2, +\infty)$

$g(n^2-n+18) = g_R = g_{[0, +\infty)} \Rightarrow R_y = \mathbb{R}$

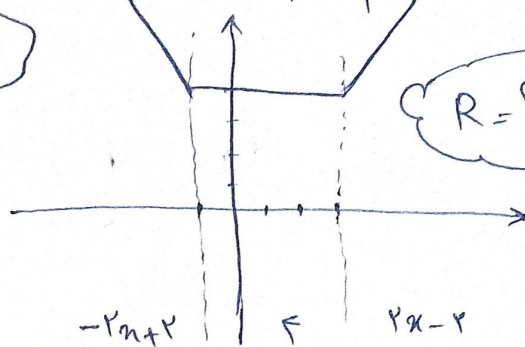
$g_r \frac{n^2+1}{n} \rightarrow g_r n + \frac{1}{n} = \int_r^{\infty} \frac{1}{x^2} dx \rightarrow g_r \frac{1}{x} \Big|_r^{\infty} = \frac{1}{r}$

گراف $y = \frac{1}{x}$ را در نظر بگیرید. دامنه: $R = [1, +\infty)$

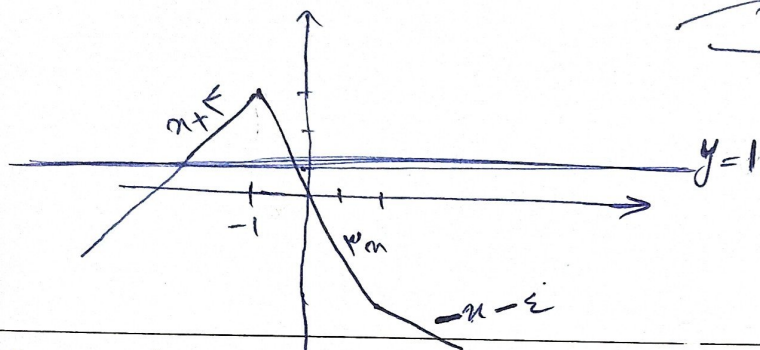
$$الف) y = |x - r| - |n - r|$$



$$ب) y = |n - r| + |n + 1|$$



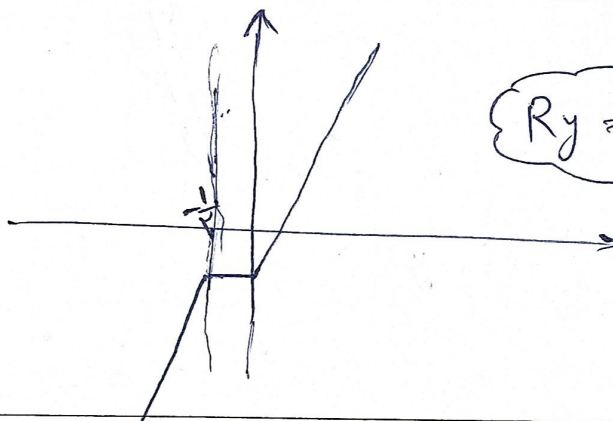
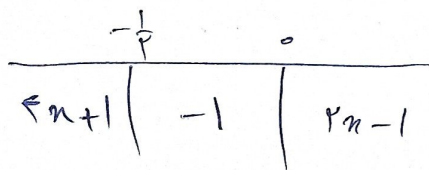
$$\frac{-1}{n+\varepsilon} \quad \frac{r}{-rn} \quad \frac{-n-\varepsilon}{-n-\varepsilon}$$



$$\begin{aligned} -rn &= 1 \rightarrow n = -\frac{1}{r} \\ n + \varepsilon &= 1 \rightarrow n = -r \end{aligned}$$

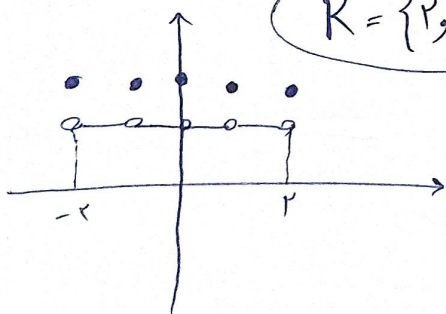
$$R = (-\infty, -r] \cup [-\frac{1}{r}, +\infty)$$

$$y = rn - |x + 1| + |n|$$

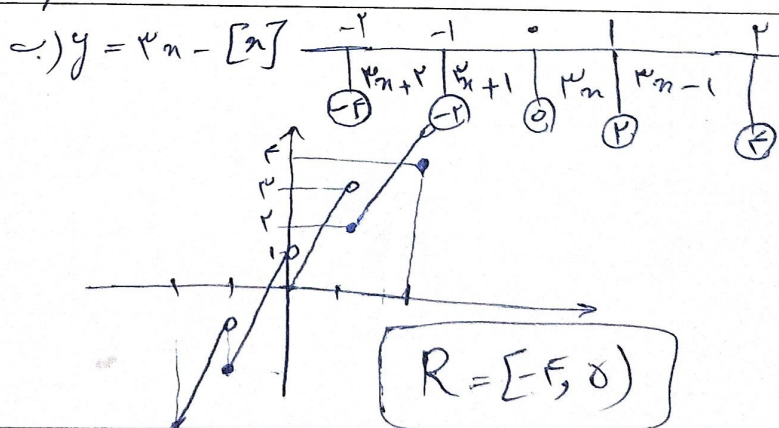


$$y = [n] + [-n] + r$$

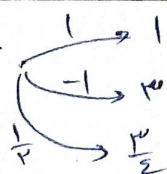
$$R = \{r, r\}$$



$$ج) y = rn - [n]$$

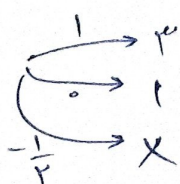


$$y = \sin^r x - \sin x + 1$$



$$R = [\frac{r}{r}, r]$$

$$y = \sin^r x + \sin^r x + 1$$



$$R = [1, r]$$