

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:

مجموعه مقادیر: $R = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$

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

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

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

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

$R(n) = \frac{n^2-n+\frac{1}{2}}{n^2-n+1} \rightarrow yn^2 - yn + y = n^2 - n + \frac{1}{2} \rightarrow (y-1)n^2 + (1-y)n + y - \frac{1}{2} = 0$

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

$\rightarrow -3y^2 + 3y - 1 = 0 \rightarrow y = \frac{1 \pm \sqrt{1-4(-3)}}{6} = \frac{1 \pm \sqrt{13}}{6}$

دایره؟ $D_f = \mathbb{R}$ مجموعه مقادیر مثبت

$R = [0, 1)$

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

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

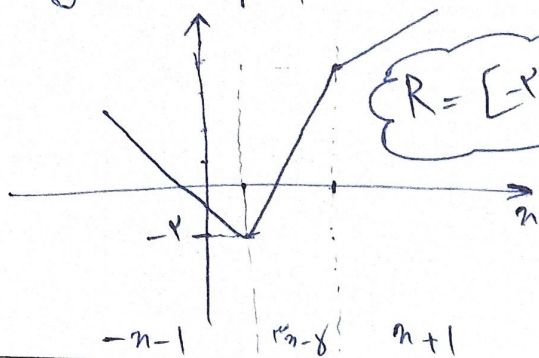
$g(n^2-n+18) = g_R = g_{[0, +\infty)} \Rightarrow R_y = \mathbb{R}$

$g_r \frac{n^2+1}{n} \rightarrow g_r n + \frac{1}{n} = \int_1^{\infty} \frac{1}{x^2} dx \rightarrow g_r \frac{1}{x^2} = 1$

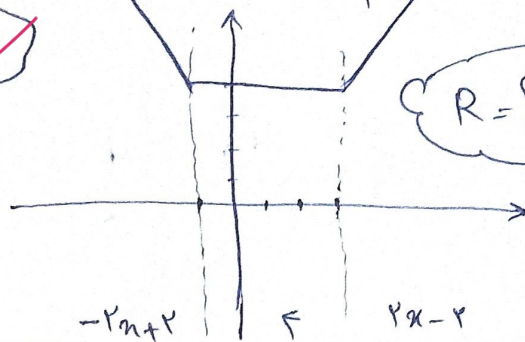
$R = [1, +\infty)$

گراف:

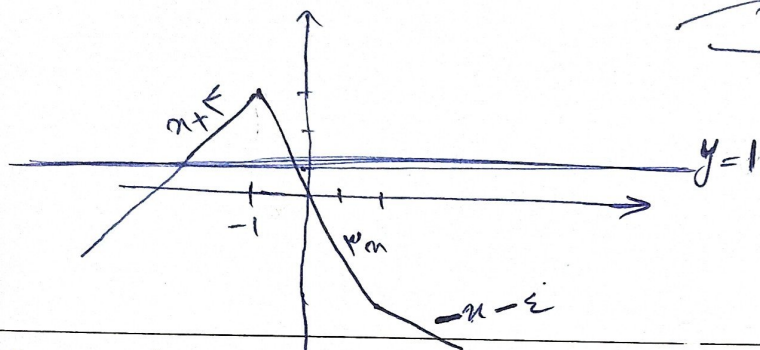
$$الف) y = |x - r| - |n - r|$$



$$ب) y = |n - r| + |n + 1|$$



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

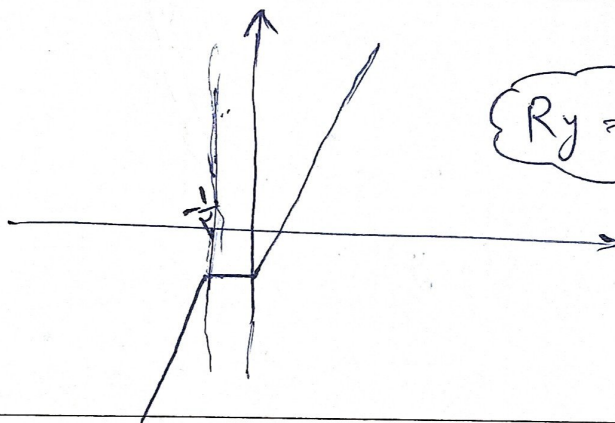


$$\begin{aligned} -r/n = 1 &\rightarrow n = -\frac{1}{r} \\ n+1 = 1 &\rightarrow n = -1 \end{aligned}$$

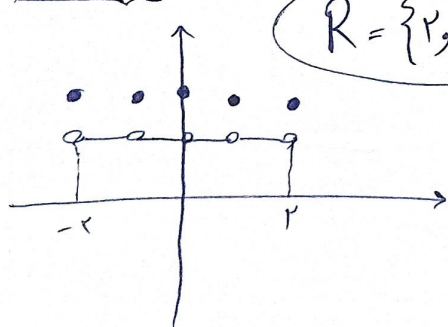
$$R = (-\infty, -r] \cup [-\frac{r}{n}, +\infty)$$

$$y = r/n - |x + 1| + |n|$$

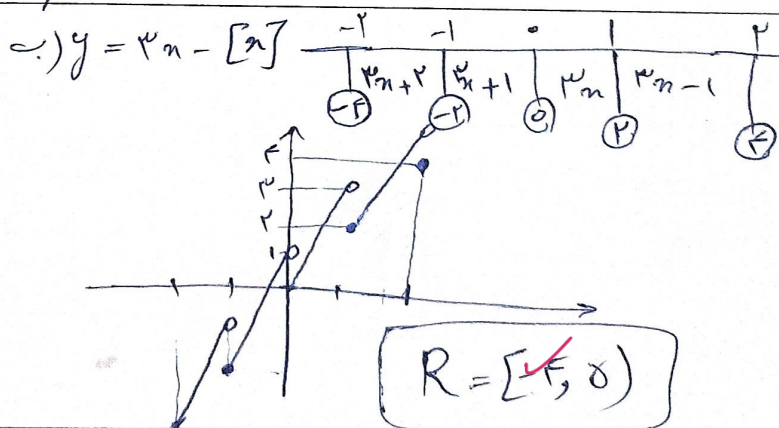
$$\frac{-1}{n+1} \quad \frac{0}{-1} \quad \frac{r/n-1}{r/n-1}$$



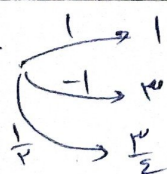
$$y = [n] + [-n] + r$$



$$ب) y = r/n - [n]$$

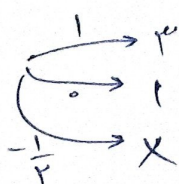


$$y = \sin^r x - \sin x + 1$$



$$R = [\frac{r}{2}, r]$$

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



$$R = [1, r]$$