

الف)  $y \in \frac{-1}{2}$  و  $y \in 1$   $\xrightarrow[\text{می شود}]{\text{خرج صفر}}$   $(-\infty, \frac{-1}{2}] \cup (1, +\infty)$   $\xrightarrow[\text{بیشترین مقدار}]{\text{کمترین د}}$

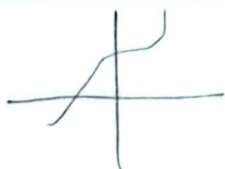
ب)  $y \in \frac{n^2}{|n|} + \frac{1}{|n|} \in |n| + \frac{1}{|n|} \Rightarrow R_f \in [2, +\infty)$

$yn + 2y \in n^2 + 2n - 2 \rightarrow n^2 + (2-y)n + 2y - 2 = 0$   
 $\Delta \geq 0 \quad 4 + y^2 - 4y + 8 + 12y \geq 0 \rightarrow y^2 + 8y + 12 \geq 0$   
 $\rightarrow (y+4)(y+2) \geq 0 \rightarrow R_f \in (-\infty, -4] \cup [-2, +\infty)$

$D_f \in \mathbb{R} \quad yn^2 - yn + y \in n^2 - n + \frac{1}{y} \rightarrow (1-y)n^2 + (y-1)n + \frac{1}{y} - yn$   
 $\Delta \rightarrow y^2 + 1 - 4y - 4(1-y)(\frac{1}{y} - y) = -2y^2 + 3y \geq 0$   
 $\rightarrow -y^2 + y \geq 0 \Rightarrow R_f \in [0, 1)$

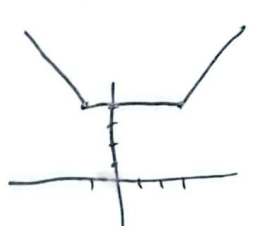
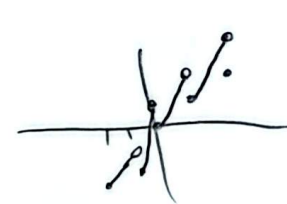
الف)  $\frac{-f}{f} \in 2 \quad -4 + 8 - 1 \in 3 \quad R_f \in [0, 3]$

ب)  $y \in \sqrt[3]{2n^2 - 8n} \rightarrow \frac{+8}{-4} \in 2 \rightarrow \sqrt[3]{8 - 16} \in -2$   
 $R_f \in [-2, +\infty)$



الف)  $\mathbb{R}$

ب)  $\frac{n^2+1}{n} \in n + \frac{1}{n} \rightarrow [2, +\infty) \rightarrow R_f \in [1, +\infty)$

|                                                                                                                                                                                                                                                                                                   |                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <p>→ <math>\frac{1}{-x-1} \mid \frac{1}{x-2} \mid x+1</math></p> <p>→ <math>R_f = [-2, +\infty)</math></p>                                                                                                       | <p>(الف)</p> <p>9</p> <p>(ب)</p>                                              |
| <p><math> x-2  - (2x+1) - 1 \leq 0 \rightarrow \frac{-1}{x+1} \mid \frac{1}{-x-2}</math></p> <p><math>R_f = (-\infty, -2] \cup [-\frac{1}{2}, +\infty)</math></p>                                                                                                                                 | <p>7</p>                                                                      |
| <p>→ <math>\frac{1}{x+1} \mid -1 \mid \frac{0}{x-1}</math></p>  <p><math>R_f \subseteq \mathbb{R}</math></p>                                                                                                   | <p>1</p>                                                                      |
| <p><math>\underbrace{[n] + [-n]}_{\{0, -1\}} + x</math></p> <p><math>R_f = \{1, 2\}</math></p>                                                                                                                 | <p>(الف)</p> <p>9</p> <p>(ب)</p> <p><math>R_f \subseteq \mathbb{R}</math></p> |
| <p><math>\max \in 1</math><br/><math>\min \in 2</math></p> <p><math>\frac{-b}{ca} = \frac{2}{2}</math></p> <p><math>R_f = [\frac{2}{2}, 2]</math></p> <p><math>\max \in 2</math><br/><math>\min \in 1</math></p> <p><math>\frac{-b}{ca} = -\frac{1}{2} \times \rightarrow R_f = [1, 2]</math></p> | <p>(الف)</p> <p>10</p> <p>(ب)</p>                                             |