

الف)  $y = \frac{m+1}{m-2}$

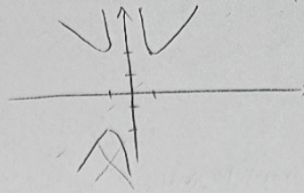
$m y - r y = m + 1$

$m(y-1) = r y + 1$

$m = \frac{r y + 1}{y - 1}$

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

ب)  $y = \frac{m^2+1}{m} = m + \frac{1}{m}$



$R_F = [2, +\infty)$

$y = \frac{n^2 + n - 2}{n + 3}$

$n^2 + n - 2 = m y + r y$

$n^2 + n(1-y) - 2 - r y = 0$

$n = \frac{y-2 \pm \sqrt{4y^2 - 4y + 1 + 4r y}}{2}$

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

$y^2 + n y + r = (y+2)(y+4)$

$\begin{matrix} -4 & -2 \\ + & - & + \end{matrix}$

$f(n) = \frac{n^2 - n + \frac{1}{2}}{n^2 - n + 1 + \frac{1}{2}}$

$1 - f(1)(1) = -\frac{1}{2} \rightarrow D_F = \mathbb{R}$

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

$\frac{1}{-1+1} = \frac{1}{0} \Rightarrow R_F = [0, 1)$

الف)  $y = \sqrt{-n^2 + 2n - 1}$

$n_{max} = \frac{-2}{-2} = 1$

$y_{max} = -1 + 1 - 1 = -1$

$\sqrt{(-\infty, 1]} = [0, \sqrt{3}] = R_F$

ب)  $y = \sqrt{2n^2 - 11n}$

$n_{min} = \frac{11}{4} = 2$

$\sqrt{[-11, +\infty)}$

$y_{min} = 11 - 11 = 0$

$R_F = [-2, +\infty)$

الف)  $y = \frac{1}{n}$

$n^2 - n + 1 \rightarrow R_F = \mathbb{R}$

در صورت A، هرگاه  $n$  را به صورت  $n = \frac{1}{m}$  در نظر بگیریم، داریم  $y = m$  و  $R_F = \mathbb{R}$

الف)  $y = \frac{m^2+1}{m} \rightarrow R_F = (-\infty, -2] \cup [2, +\infty)$

$y = \frac{1}{n} \rightarrow y^2 = 1$

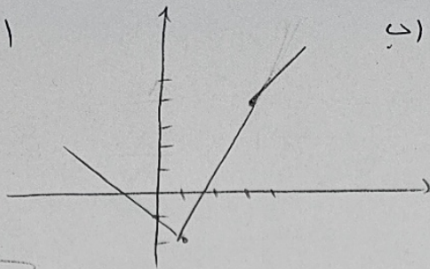
$R_F = [1, +\infty)$

الف)  $|x-2| - |x-3|$

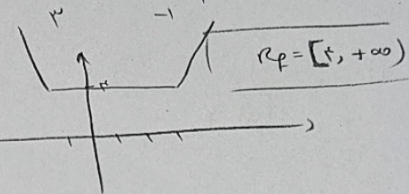
|        |        |        |
|--------|--------|--------|
| $-x+2$ | $x-2$  | $x-2$  |
| $+x-2$ | $+x-2$ | $-x+3$ |
| $-x-1$ | $x-2$  | $x+1$  |

(-2) (2)

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



ب)  $y = |x-2| + |x+1|$

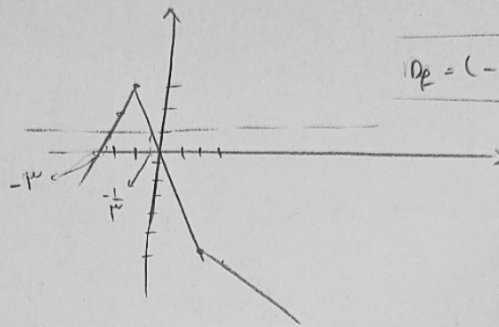


$|x-2| - |x+2| \leq 1$

|        |        |           |
|--------|--------|-----------|
| $-x+2$ | $-x+2$ | $x-2-x-2$ |
| $x+2$  | $-x-2$ | $-x-2$    |
| $x+2$  | $x-2$  | $-x-2$    |

(-2) (-4)

$-x=1$   
 $x=-1$   
 $x+2=1 \quad x=-1$



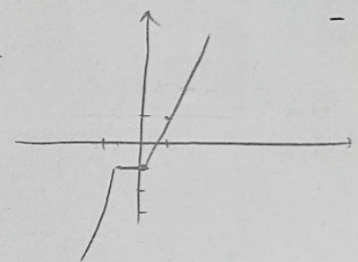
$R_f = (-\infty, -1] \cup [-1, +\infty)$

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

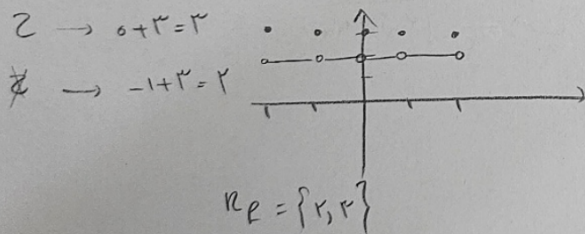
$R_f = \mathbb{R}$

|         |         |           |
|---------|---------|-----------|
| $x+x+1$ | $x-x-1$ | $x-x-1+x$ |
| $-x$    | $-x$    | $x-1$     |
| $x+1$   | $-1$    | $x-1$     |

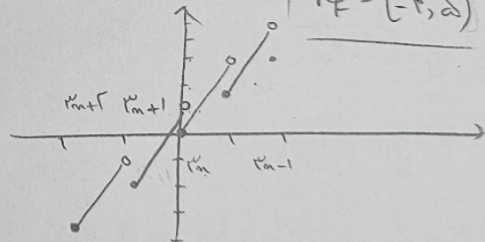
(-1) (-1)



الف)  $y = [x] + [x-2]$



ب)  $y = x - [x]$



الف)  $y = \sin^2 x - \sin x + 1$

$\sin x \begin{cases} \min = -1 \rightarrow 1+1+1=3 \\ \max = 1 \rightarrow 1-1+1=1 \end{cases} \quad R_f = [\frac{1}{2}, 3]$

$-\frac{b}{2a} = \frac{1}{2} \rightarrow \frac{1}{2} + 1 = \frac{3}{2}$

ب)  $y = \sin^2 x + \sin x + 1$

$\sin x \begin{cases} \max = 1 \rightarrow 3 \\ \min = 0 \rightarrow 1 \end{cases} \quad R_f = [1, 3]$

$-\frac{b}{2a} = \frac{-1}{2} \times$