

نام و نام خانوادگی: زهرا سادات حسینی با رضایت شریعتی ثبت شده است ۵۱۰۵
 کلاس: دوازدهم ریاضی A

$$\text{الف) } \frac{|x|+1}{|x|-2} = y \rightarrow |x| = + \frac{y+1}{y-1} \rightarrow \frac{y+1}{y-1} \geq 0 \rightarrow R = \mathbb{R} - \left(-\frac{1}{2}\right)$$

$$\text{ب) } \frac{|x^2|+1}{|x|} = y \rightarrow |x^2|+1 = y|x| \rightarrow |x^2| - y|x| + 1 = 0 \xrightarrow{\Delta \geq 0} y^2 - 4 \geq 0 \rightarrow y \leq -2 \text{ یا } y \geq 2$$

$R = [2, +\infty)$

$$y = \frac{x^2 + 5x - 2}{x + 2} \rightarrow yx + 2y = x^2 + 5x - 2 \rightarrow x^2 + (2-y)x - 2y - 2 = 0 \xrightarrow{\Delta \geq 0} (2-y)^2 + 4(2y+2) \geq 0$$

$$\hookrightarrow y^2 - 4y + 4 + 8y + 8 \geq 0 \rightarrow y^2 + 4y + 12 \geq 0 \rightarrow (y+2)(y+6) \geq 0 \rightarrow \frac{-4 \pm \sqrt{16-48}}{2} \rightarrow R = \mathbb{R} - (-4, -6)$$

$$f(x) = \frac{x^2 - x + \frac{1}{2}}{x^2 - x + 1} = \frac{(x - \frac{1}{2})^2}{x^2 - x + 1} \xrightarrow{\Delta \geq 0} x^2 - x + 1 \geq 0 \Rightarrow D = \mathbb{R}$$

$R = [0, 1]$

$$\hookrightarrow yx^2 - yx + y = x^2 - x + \frac{1}{2}$$

$$(y-1)x^2 + (-y+1)x + y - \frac{1}{2} = 0 \xrightarrow{\Delta \geq 0} (-y+1)^2 - 4(y-\frac{1}{2}) \geq 0$$

$y^2 - 2y + 1 - 4y + 2 \geq 0$

$$y^2 - 4y + 3 \geq 0 \rightarrow -3y^2 + 4y - 1 \geq 0 \rightarrow y(-y+1) \geq 0 \Rightarrow R = [0, 1]$$

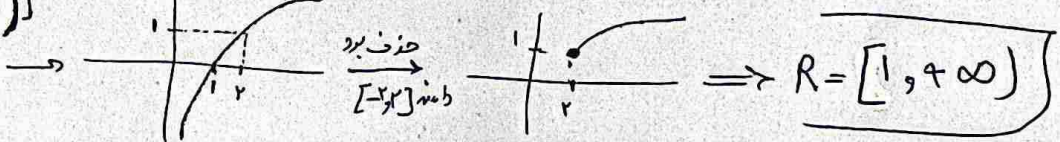
$$\text{الف) } \frac{-b}{\frac{1}{a} - r} = \frac{-r}{-r} = 1 \rightarrow y = -r + 1 - 1 = -r \text{ و } R = \sqrt{(-\infty, r]} \Rightarrow [0, \sqrt{3}]$$

$$\text{ب) } \frac{-b}{\frac{1}{a} - r} = \frac{1}{r} = 1 \rightarrow y = 1 - 1r = -1 \text{ و } R = \sqrt{[-1, +\infty)} = R \Rightarrow [1, +\infty)$$

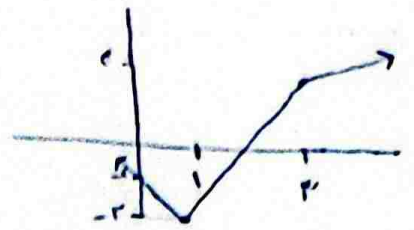
$$\text{الف) } x^2 - x + 1 \rightarrow R = \mathbb{R} \Rightarrow y = f(x) \rightarrow R = \mathbb{R}$$

$$\text{ب) } \frac{x^2+1}{x} = y \rightarrow x^2 - yx + 1 = 0 \xrightarrow{\Delta \geq 0} y^2 - 4 \geq 0 \rightarrow y \leq -2 \text{ یا } y \geq 2 \rightarrow R = \mathbb{R} - (-2, 2)$$

$$\hookrightarrow \bigcup_{r=2}^{\infty} \mathbb{R} - (-r, r) \rightarrow \mathbb{R} - (-2, 2)$$



الف) $y = |x-2| - |x-3| \rightarrow -x-1 \begin{cases} x-2 < 0 \\ x-3 < 0 \end{cases} \rightarrow x < 2$
 $\downarrow$ (1) (2) (3) (4)
 $R = [-2, +\infty)$



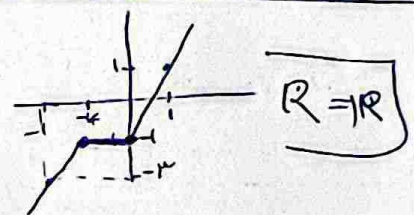
ب) $y = |x-2| + |x+1| \xrightarrow{\text{نقطه صفر}}$ $\rightarrow R = [1, +\infty)$

افضلها بـ $\{ -2, 2 \}$ $|2 - (-1)| = 3$
 افضلها بـ a

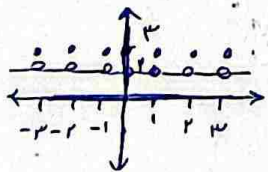
$|x-2| - |2x+2| \leq 1$
 $(2) \quad (1)$
 $-x+2+2x+2 \leq 1 \rightarrow x \leq -3$
 $x-2-2x-2 \leq 1 \rightarrow -x-4 \leq 1 \rightarrow x \geq -5$
 $x-2-2x-2 \geq 1 \rightarrow -x-4 \geq 1 \rightarrow x \leq -5$
 $-x \leq 0 \rightarrow x \geq 0$
 $x \geq 2$

محدوده جواب: $(-\infty, -3] \cup [-1, +\infty)$

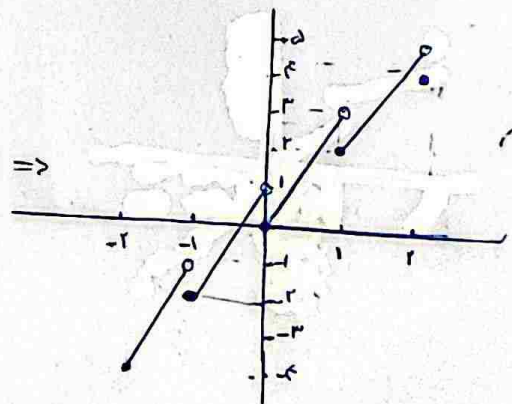
$y = 3x - |x+1| + |x| \Rightarrow \begin{cases} 0 = x \rightarrow y = -1 \\ -1 = x \rightarrow y = -1 \\ 1 = x \rightarrow y = 1 \\ -1 = x \rightarrow y = -3 \end{cases}$
 $(-1/2) \quad (0)$



الف) $y = [x] + 3 + [-x] \rightarrow \begin{cases} [x] + [-x] = 0 ; x \in \mathbb{Z} \xrightarrow{3+3} 6 ; x \in \mathbb{Z} \\ [x] + [-x] = -1 ; x \notin \mathbb{Z} \xrightarrow{3+3} 5 ; x \notin \mathbb{Z} \end{cases} \Rightarrow R = \{2, 3\}$



ب) $y = 3x - [x] \rightarrow \begin{cases} x < -1 \rightarrow y = 3x+2 \\ -1 \leq x < 0 \rightarrow y = 3x+1 \\ 0 \leq x < 1 \rightarrow y = 3x \\ 1 \leq x < 2 \rightarrow y = 3x-1 \\ x = 2 \rightarrow y = 3x-2 \end{cases}$
 $\downarrow R = [-1, 5)$



الف) $y = \sin^2 x + \sin x + 1 \rightarrow \sin x \begin{cases} 1 \rightarrow 1+1+1=3 \\ -1 \rightarrow 1+1+1=3 \\ 0 \rightarrow 0+0+1=1 \end{cases} \rightarrow R = [1, 3]$
 $\frac{1}{2} = \frac{b}{a} = \frac{1}{2} - \frac{1}{2} + 1 = \frac{1}{2}$

ب) $y = \sin^2 x + \sin^2 x + 1 \rightarrow \sin^2 x \begin{cases} 1 \rightarrow 1+1+1=3 \\ 0 \rightarrow 0+0+1=1 \end{cases} \rightarrow R = [1, 3]$
 $\sin^2 x = \frac{1}{2} \rightarrow \frac{1}{2} = \frac{1}{2} \rightarrow x$