

۱۹, ۲۵

$$1) \frac{|x+1|}{|x|-2} = y \rightarrow |x| = \frac{y+1}{y-1}$$

$$\frac{-\frac{1}{2}}{+\frac{1}{2} - \frac{1}{2}}$$

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

$$2) y = \frac{x^2+1}{|x|} = |x| + \frac{1}{|x|}$$

$$R = [2, \infty)$$

(۲) (۱)

$$2y+1=0 \rightarrow 2y=-1 \rightarrow y=-\frac{1}{2}$$

$$y = \frac{x^2+2x-2}{x+3} \rightarrow yx+3y = x^2+2x-2 \rightarrow x^2+x(2-y)-2-3y=0$$

$$\Delta = b^2-4ac = (2-y)^2 - 4(-2-3y) = 4+y^2-4y+8+12y = y^2+8y+12 \geq 0 \rightarrow (y+2)(y+4) \geq 0$$

(۲) (۲)

$$\frac{-2}{+\frac{1}{2} - \frac{1}{2}}$$

$$R = (-\infty, -2] \cup [-4, \infty)$$

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

$$\Delta \geq 0$$

$$D = \mathbb{R}$$

$$f(x) = \frac{x^2}{x^2+\frac{1}{4}}$$

میتوانست از روش مربع هم استفاده کرد
محدود کننده ی تابع یعنی ۱ است
و تابع در انزای هیچ مقداری برابر یک نمیشه پس بره بدیدر است: $R_y = [0, 1)$

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

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

$$\rightarrow 1+y^2-2y+4y-1-4y^2+4y \geq 0 \rightarrow -3y^2+4y \geq 0 \rightarrow y(-3y+4) \geq 0$$

$$R = [0, \frac{4}{3}]$$

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

$$2 \rightarrow -1+1-1 = -1$$

$$R = [0, \frac{1}{2}]$$

$$4) \frac{-b}{2a} = \frac{1}{2} = \frac{1}{2}$$

$$2 \rightarrow 1-1-1 = -1$$

$$R = [0, \frac{1}{2}]$$

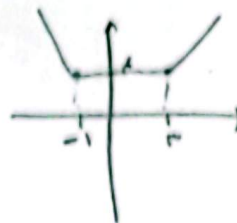
$$2) y = |x-1| - |x-2|$$

$$\frac{1}{x-1} \quad \frac{1}{x-2}$$



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

$$3) y = |x-1| + |x+1|$$



$$R = [1, +\infty)$$

(2) (✓)

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

$$\begin{array}{c|c|c} -1 & 2 & \\ \hline -x+2 & x+2 & x+1 \\ \hline x & x & x \end{array}$$

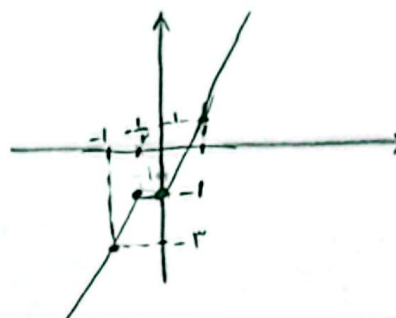
$$(-\infty, -3] \cup [-\frac{1}{2}, +\infty)$$

(2) (✓)

$$y = 3x - |x+1| + |x|$$

$$x+1=0 \rightarrow x=-1 \rightarrow x=-\frac{1}{2}$$

$$\begin{array}{c|c|c} -\frac{1}{2} & 0 & \\ \hline 3x & -x-1 & x \\ \hline 3x & -x-1 & x \end{array}$$

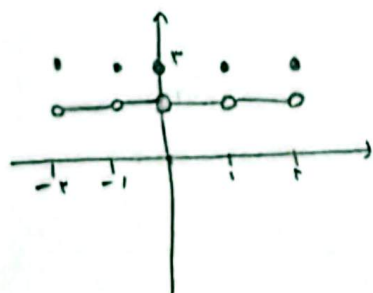


$$R = [1, +\infty)$$

(2) (✓)

$$4) y = [x] + [x-1] \rightarrow y = [x] + [-x] + 1$$

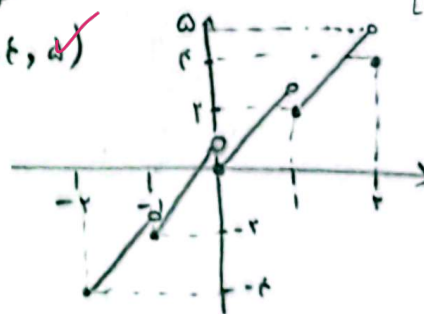
$$x + 1 - x = 1 \leftarrow \text{constant}$$



$$R = \{1\}$$

$$5) y = 3x - [x]$$

$$R = [-1, +\infty)$$



(2) (✓)

$$6) \sin^2 x - \sin x + 1 \leq 1 \rightarrow \sin^2 x - \sin x \leq 0$$

$$R = [0, 1]$$

$$7) \sin^2 x + \sin^2 x + 1 \leq 3 \rightarrow 2\sin^2 x \leq 2 \rightarrow \sin^2 x \leq 1$$

$$R = [-1, 1]$$

(2) (✓)