

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

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

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

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

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

(1)

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

$$\Delta = b^2-4ac = (2-y)^2 - 4(-2-2y) = 4+y^2-4y+8+8y = y^2+4y+12 \geq 0 \rightarrow (y+2)(y+6) \geq 0$$

(2)

$$\frac{-2}{+\frac{1}{2}-\frac{1}{2}} \quad R = (-\infty, -2] \cup [-6, +\infty)$$

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

$$yx^2-yx+y = x^2-x+\frac{1}{2} \rightarrow (y-1)x^2+(1-y)x+y-\frac{1}{2} = 0 \quad \Delta = b^2-4ac = (1-y)^2 - 4(y-\frac{1}{2})(y-\frac{1}{2}) \geq 0$$

$$\rightarrow 1+y^2-2y+4y-2 \geq 0 \rightarrow -2y^2+2y \geq 0 \rightarrow y(-y+1) \geq 0 \quad \frac{0}{-\frac{1}{2}+\frac{1}{2}} \quad R = [0, 1]$$

$$3) \frac{-b}{ra} = \frac{-6}{-2} = 2$$

$$2 \rightarrow -6+1-1 = 3$$

$$R = [0, \sqrt{3}]$$

$$4) \frac{-b}{ra} = \frac{1}{6} = 2$$

$$2 \rightarrow 1-12 = -11$$

$$R = [-11, +\infty)$$

(3)

$$5) x^2-x+1 \rightarrow \mathbb{R}$$

$$y = \log^{\mathbb{R}} \rightarrow R = \mathbb{R}$$

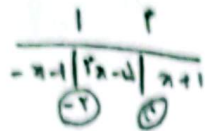
$$6) y = \log_r \frac{x^2+1}{x} \rightarrow x + \frac{1}{x} > 0 \rightarrow R = [2, +\infty)$$

$$\log_r^2 = 1$$

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

(4)

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



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



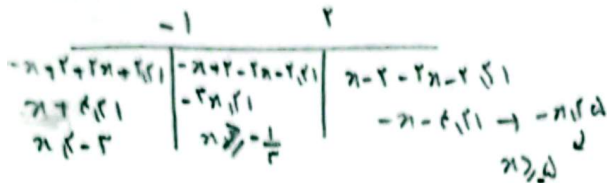
$$3) y = |x-1| + |x+1|$$



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

(✓)

$$|x-1| - |x+2| < 1$$

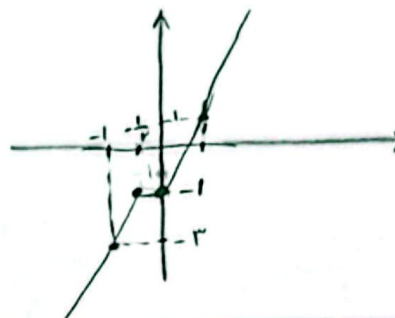
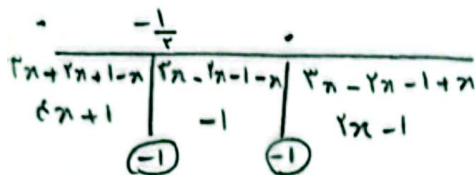


$$(-\infty, -1] \cup [-\frac{1}{2}, +\infty)$$

(✓)

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

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



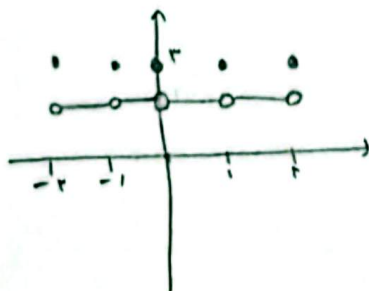
$$R = [1, \infty)$$

(✓)

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

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

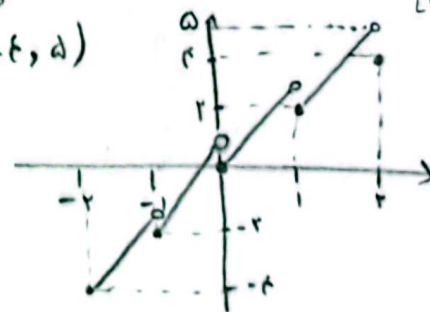
$$1 \leftarrow \text{constant}$$



$$R = \{1, 2\}$$

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

$$R = [-1, 1)$$



(✓)

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

$$R = [0, 1]$$

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

$$R = [1, 2]$$

(✓)