

Subject.

تالیف شماره ۵ (دوازدهم فصل) (دانش یار)

Day. Month. Year.

$$\text{الف) } y = \frac{|x|+1}{|x|-2} \rightarrow |x| = \frac{2y+1}{y-1} \rightarrow \frac{2y+1}{y-1} \geq 0 \quad \frac{-\frac{1}{2}}{+\phi - \frac{1}{\phi} +}$$

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

$$\text{ب) } y = \frac{x^2+1}{|x|} = |x| + \frac{1}{|x|} \quad |x| > 0 \rightarrow |x| + \frac{1}{|x|} \geq 2 \rightarrow R = [2, +\infty)$$

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

$$\rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \Delta \geq 0 \rightarrow b^2 - 4ac \geq 0 \rightarrow (2-y)^2 - 4(-2-2y) \geq 0$$

$$\rightarrow y^2 + 4y + 12 \geq 0 \rightarrow (y+2)(y+6) \geq 0 \quad \frac{-2}{+\phi - \frac{-6}{\phi} +} \rightarrow R = (-\infty, -6] \cup [2, +\infty)$$

$$f(x) = \frac{x^2 - x + \frac{1}{\varepsilon}}{x^2 - x + 1} \rightarrow \Delta < 0 \rightarrow \text{غیر مثبت ندارد} \rightarrow D_f = \mathbb{R}$$

$$yx^2 - yx + y = x^2 - x + \frac{1}{\varepsilon} \rightarrow (1-y)x^2 + (y-1)x + \frac{1}{\varepsilon} - y = 0 \rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \Delta \geq 0$$

$$\rightarrow (y-1)^2 - 4(1-y)(\frac{1}{\varepsilon} - y) \geq 0 \rightarrow -2y^2 + 2y \geq 0 \rightarrow -y(y-1) \geq 0 \quad \frac{0}{-\phi + \frac{1}{\phi} -}$$

$$\leadsto a \neq 0 \Rightarrow 1-y \neq 0 \rightarrow y \neq 1 \quad \textcircled{1} [0, 1] \quad \checkmark$$

$$R_f = \textcircled{1} \cap \textcircled{2} = [0, 1)$$

$$\text{الف) } y = \sqrt{-x^2 + 5x - 1} \rightarrow x_5 = \frac{-b}{2a} = 2 \rightarrow y_5 = 3 \quad a < 0 \rightarrow R = \sqrt{(-\infty, 3]} = [0, 3]$$

$$\text{ب) } y = \sqrt[3]{2x^2 - 11x} \rightarrow x_5 = \frac{-b}{2a} = 2 \rightarrow y_5 = -1 \quad a > 0 \rightarrow R = \sqrt[3]{[-1, +\infty)} = [-1, +\infty)$$

$$\text{الف) } y = \log_2(x^2 - x + 11) \rightarrow R = (-\infty, +\infty) = \mathbb{R}$$

چون بیشترین توان عبارت فرد است مقدار تابع در بازه $(-\infty, +\infty)$ بازه $(-\infty, +\infty)$ را در بر می گیرد.

MR

$$1) y = \log_r \left(\frac{x^r + 1}{x} \right) \rightarrow \frac{x^r + 1}{x} = x + \frac{1}{x} \rightarrow x > 0 \rightarrow x + \frac{1}{x} \in [2, +\infty) \text{ قبل قبول } \checkmark$$

$$\rightarrow x < 0 \rightarrow x + \frac{1}{x} \in (-\infty, -2] \text{ غير مقبل قبل } \times$$

$$\rightarrow R = \log_r [2, +\infty) = [1, +\infty)$$

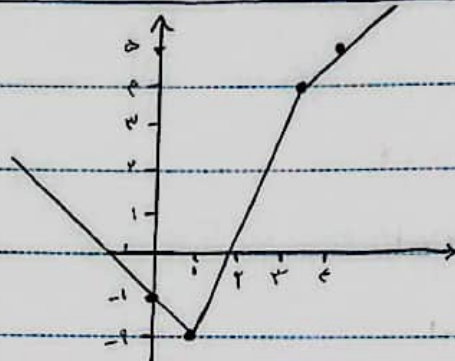
$$2) y = |2x - 2| - |x - 3|$$

$$x = 0 \rightarrow y = -1$$

$$x = 1 \rightarrow y = -2$$

$$x = 3 \rightarrow y = 1$$

$$x = 5 \rightarrow y = 2$$



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

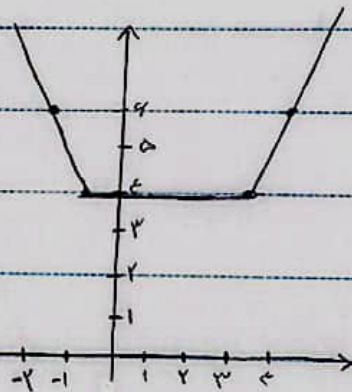
$$3) y = |x - 3| + |x + 1|$$

$$x = -2 \rightarrow y = 2$$

$$x = -1 \rightarrow y = 1$$

$$x = 3 \rightarrow y = 1$$

$$x = 5 \rightarrow y = 2$$



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

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

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

$$x \leq -3$$

$$-1$$

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

$$x \geq -\frac{1}{3}$$

$$2$$

$$x - 2 - 2x - 2 \leq 1$$

$$x \geq -5$$

$$\text{الحل: } (-\infty, -3] \cup \left[-\frac{1}{3}, +\infty\right)$$

$$-\frac{1}{3} \leq x < 2$$

$$x \geq 2$$

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

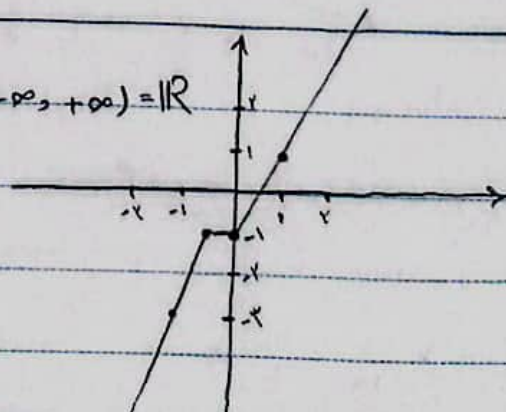
$$R = (-\infty, +\infty) = \mathbb{R}$$

$$x = -1 \rightarrow y = -3$$

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

$$x = 0 \rightarrow y = -1$$

$$x = 1 \rightarrow y = 1$$



الف) $y = [x] + [x - 2] = [x] + [-x] + 2$

$R = \{2, 3\}$

ب) $y = 3x - [x]$

$-2 \leq x < -1 \rightarrow y = 3x + 2$

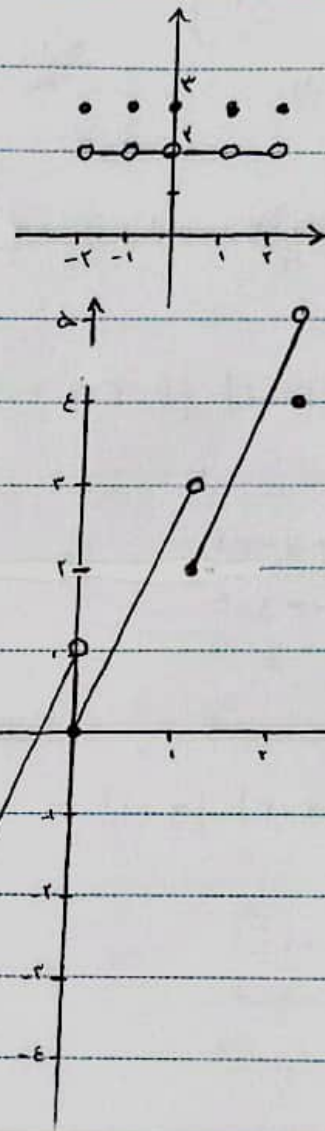
$-1 \leq x < 0 \rightarrow y = 3x + 1$

$0 \leq x < 1 \rightarrow y = 3x$

$1 \leq x < 2 \rightarrow y = 3x - 1$

$x = 2 \rightarrow y = 5$

$R = [-5, \infty)$



الف) $y = \sin^2 x - \sin x + 1$

$\sin x \rightarrow \max = 1 \rightarrow y = 1$

$\min = -1 \rightarrow y = 3$

$\Rightarrow R = \left[-\frac{1}{e}, 3\right]$

$\frac{-b}{ra} = \frac{1}{r} \checkmark \rightarrow y = \frac{1}{e}$

ب) $\sin^2 x + \sin^2 x + 1$

$\sin^2 x \rightarrow \max = 1 \rightarrow y = 3$

$\min = 0 \rightarrow y = 1$

$\Rightarrow R = [1, 3]$

$\frac{-b}{ra} = \frac{-1}{r} \checkmark$