

شماره تلفن: ۵

روزهم دفتر

۲۰ آفرین

نام خانوادگی: سادات فاریح

سوال ۱ (۲)

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

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

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

$\begin{cases} -x - \frac{1}{x} \rightarrow x < 0 \rightarrow -(x + \frac{1}{x}) \rightarrow (-\infty, -2] \xrightarrow{x \rightarrow 0^-} [2, +\infty) \\ x + \frac{1}{x} \rightarrow x > 0 \rightarrow [2, +\infty) \end{cases}$

$\Rightarrow R = [2, +\infty)$ ✓

$y = \frac{x^2+2x-2}{x+3} \rightarrow y = \frac{(x+3)(x-1)+1}{x+3} = x-1 + \frac{1}{x+3} = x+3 + \frac{1}{x+3} - 4$

سوال ۲ (۲)

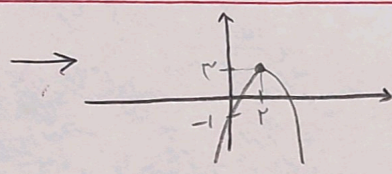
$\rightarrow R = (-\infty, -2] \cup [2, +\infty)$ $\Rightarrow R = (-\infty, -4] \cup [-2, +\infty)$ ✓

$f(x) = \frac{x^2-x+\frac{1}{x}}{x^2-x+1} = \frac{(x-\frac{1}{x})^2}{x^2-x+1}$: همواره $\begin{cases} f(x) < 1 \text{ : صورت } < \text{ مخرج} \\ f(x) = 0 \text{ : صورت } = 0 \text{ و مخرج } \neq 0 \\ f(x) > 0 \text{ : صورت } > 0 \text{ و مخرج } > 0 \end{cases} \Rightarrow f(x) \geq 0$

سوال ۳ (۲)

$\Rightarrow R = [0, 1]$ ✓ $x^2-x+1 \neq 0 \rightarrow D = R$ ✓

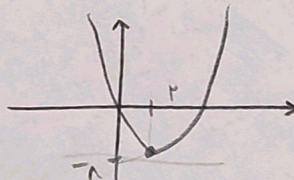
الف) $y = \sqrt{-x^2+4x-1}$ $\left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \right|$



$\Rightarrow R = [0, \sqrt{3}]$ ✓

سوال ۴ (۲)

ب) $y = \sqrt[3]{2x^2-4x}$ $\left| \frac{-b}{2a} = \frac{-4}{4} = -1 \right|$



$\rightarrow [-\infty, +\infty) \xrightarrow{\sqrt[3]{}} R = [-\sqrt[3]{2}, +\infty)$ ✓

الف) $y = \log(x^2-x+1)$

دارای بازترین توان فرد $\Rightarrow R = R$

$\xrightarrow{\log(\cdot)} R$ ✓

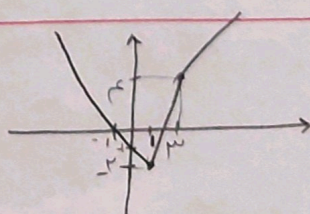
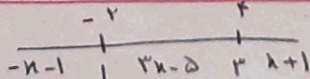
سوال ۵ (۲)

ب) $y = \log_2\left(\frac{x^2+1}{x}\right)$

$x + \frac{1}{x}$ (در $\log$ است پس $\log$ مثبت باشد) $\rightarrow R = [2, +\infty)$

$\xrightarrow{\log(\cdot)} [1, +\infty)$ ✓

الف) $y = |2x-2| - |x-3|$

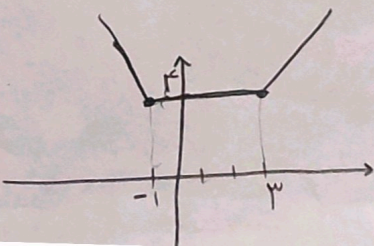


$\Rightarrow R = [-2, +\infty)$ ✓

سوال ۶ (۲)

ب) $y = |x-3| + |x+1|$

تبدیل

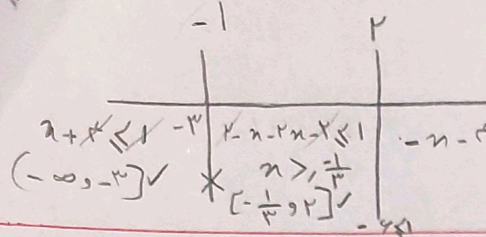


$\Rightarrow R = [4, +\infty)$ ✓

سوال ٧

(٢)

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

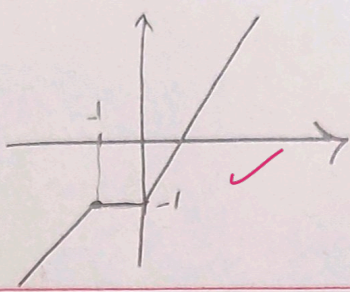
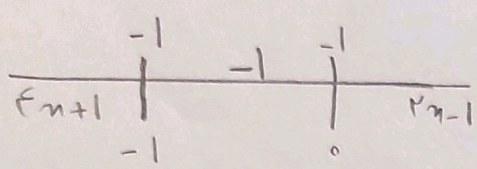


همراهی ببریم

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

سوال ٨
[2, +∞) ✓

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

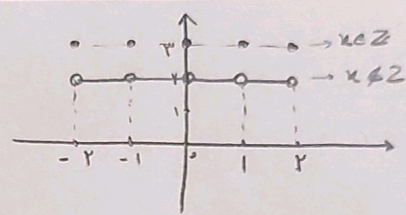


$$\Rightarrow R = \mathbb{R}$$

سوال ٩

(٢)

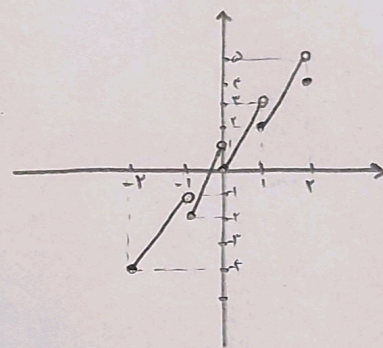
الف) $y = [x] + [3-x] = 3 + [x] + [-x]$
 $3 + [-x]$



$$R = \{2, 3\}$$

ب) $y = 3x - [x]$:

- $-2 \leq x < -1 \rightarrow 3x+2$
- $-1 \leq x < 0 \rightarrow 3x+1$
- $0 \leq x < 1 \rightarrow 3x$
- $1 \leq x < 2 \rightarrow 3x-1$
- $x=2 \rightarrow f$



$$R = [-\frac{4}{3}, 5)$$

سوال ١٠

(٢)

الف) $y = \sin^2 x - \boxed{\sin x} + 1$:

$$\begin{cases} \max = 1 \rightarrow 1 - 1 + 1 = 1 \\ \min = -1 \rightarrow 1 + 1 + 1 = 3 \\ \frac{-b}{2a} = \frac{1}{2} \rightarrow \frac{1}{4} - \frac{1}{4} + 1 = \frac{3}{4} \end{cases}$$

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

ب) $y = \sin^2 x + \boxed{\sin^2 x} + 1$:

$$\begin{cases} \max = 1 \rightarrow 3 \\ \min = 0 \rightarrow 1 \\ \frac{-b}{2a} = \frac{1}{2} \times \sin^2 x \geq 0 \end{cases}$$

$$\Rightarrow R = [1, 3]$$