

نام و نام خانوادگی شماره کلاس (پارچه ۱)

الف) $y = \frac{|x|+1}{|x|-2}$

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

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

$\max |x| = +\infty \rightarrow 1$

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

$|x| > 0 \rightarrow R = [2, +\infty)$

$y = \frac{x^2 + 2x - 2}{x + 3}$

$u = \frac{-2+y \pm \sqrt{(2-y)^2 - 4(-2-y)}}{1}$

$yx + 3y = x^2 + 2x - 2$

$\Rightarrow x^2 - 2x + y^2 + 4 + 12y \geq 0$

$x^2 + (2-y)x + (-2-3y)$

$y^2 + 4y + 12 \geq 0$

$y \mid \begin{array}{cc} -6 & -2 \\ + & - \end{array}$

$R: (-\infty, -6] \cup [-2, +\infty)$

$\leftarrow -6 \quad \rightarrow -2$

$D(f): x^2 - x + 1 = 0 \quad a = 1 > 0 \quad \Delta = 1 - 4 = -3 < 0 \Rightarrow D(f) = \mathbb{R}$

$R(f): f(x) = \frac{x^2 - x + \frac{1}{x}}{x^2 - x + 1} = \frac{(x - \frac{1}{2})^2 + \frac{3}{4}}{(x - \frac{1}{2})^2 + \frac{5}{4}} \sim \frac{\square^2 + \frac{3}{4}}{\square^2 + \frac{5}{4}} \quad \min \square = 0 \rightarrow 0$
 $\max \square = +\infty \rightarrow 1$

الف) کسی که خروج آن همواره زیاده از صفر است آن است $\Rightarrow R = [0, 1)$

خرج صفر ندارد $\Rightarrow R_f = [0, 1)$

الف) $y = \sqrt{-x^2 + 2x - 1}$

ب) $y = \sqrt[3]{2x^2 - 12x}$

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

$\frac{-b}{2a} = \frac{12}{2} = 6$

$\Rightarrow$ عرض اکثر = 3 $\left\{ \begin{array}{l} R = (-\infty, 3] \\ \text{محدوده تعریف}$

$\left. \begin{array}{l} \text{عرض اکثر} = -1 \\ a = 2 > 0 \end{array} \right\} R = [-1, +\infty)$

$a = -1 < 0$

$R_y = \sqrt{(-\infty, 3]} = [0, 3]$

$R_y = \sqrt[3]{[-1, +\infty)} = [-1, +\infty)$

الف) $y = \log(x^3 - x + 1)$

ب) $y = \log_{\frac{1}{2}}(\frac{x^2+1}{x})$ طبع باشد $\frac{x^2+1}{x} > 0 \rightarrow x > 0$

$\log_{\frac{1}{2}} 2 = 1 \Rightarrow R_y = \mathbb{R}$

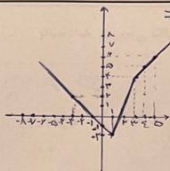
$\frac{x^2+1}{x} = x + \frac{1}{x}, x > 0 \rightarrow R = [2, +\infty)$

$\log_{\frac{1}{2}} 1 = 0$

$\rightarrow R_{(y)} = [1, +\infty)$

$\log_{\frac{1}{2}} +\infty = -\infty$

$y = x + 1 \quad x \geq 1$
 $y = 1 - x \quad 1 \leq x \leq 1$
 $y = -x - 1 \quad x \leq 1$
 $x = 1 \rightarrow y = 2$
 $x = 1 \rightarrow y = 0$
 $x = 1 \rightarrow y = -2$
 $x = -1 \rightarrow y = 1$
 $R = [-1, +\infty)$



$|x-1| + |x-(-1)|$
 $x \rightarrow 0 + |1+1| = 2$
 $R = [\varepsilon, +\infty)$

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

$x \geq 1 \rightarrow x-1-x-1 = -2 \quad R: (-\infty, -1)$

$-1 \leq x \leq 1 \rightarrow -x-1-x-1 = -2x-2 \quad R: [-\infty, 1] \quad -x+1 \leq 1 \rightarrow x \geq 0$

$x \leq -1 \rightarrow -x+1+x+1 = 2 \quad R: (-\infty, 1] \quad x+1 \leq 1 \rightarrow x \leq 0$

$R = (-1, 0)$

Y

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

$x \geq 0 \rightarrow |x| - |x+1| + |x| = x-1 \quad R: [-1, +\infty)$

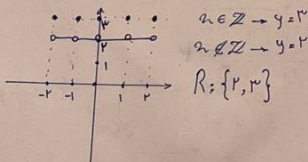
$-\frac{1}{x} \leq x \leq 0 \rightarrow |x| - |x+1| - |x| = -1 \quad R: \{-1\}$

$x \leq -\frac{1}{x} \rightarrow |x| + |x+1| - |x| = x+1 \quad R: (-\infty, -1]$

$R = \mathbb{R}$

A

$y = [x] + [x-1] = [x] + [-x] + 1$



$x \in \mathbb{Z} \rightarrow y = 1$

$x \notin \mathbb{Z} \rightarrow y = 1$

$R: \{1\}$

$y = |x| - [x]$

$[0, 1) = |x|$

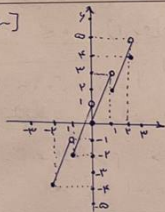
$[1, 2) = |x| - 1$

$\{x\} = |x| - 1$

$[-1, 0) = |x| + 1$

$[-2, -1) = |x| + 1$

$R = [-1, \infty)$



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$y = \sin^2 x - \sin x + 1$

$\min \sin = -1 \rightarrow 1 + 1 + 1 = 3$

$\max \sin = 1 \rightarrow 1 - 1 + 1 = 1$

$\frac{-b}{2a} = \frac{1}{2} \rightarrow \frac{1}{4} - \frac{1}{4} + 1 = \frac{3}{4}$

$R(y) = [\frac{3}{4}, 3]$

$y = \sin^2 x + \sin^2 x + 1$

$\min \sin^2 = 0 \rightarrow 0 + 0 + 1 = 1$

$\max \sin^2 = 1 \rightarrow 1 + 1 + 1 = 3$

$\frac{-b}{2a} = \frac{-1}{2} \rightarrow \sin^2 x = \frac{1}{4}$

$R(y) = [1, 3]$

1.