

نام و نام خانوادگی: محمد مهدی روحانی / پاسخنامه تشریحی تکلیف شماره ۱۱ / کلاس: دوازدهم پسران A

الف) $|x| \rightarrow [0, +\infty)$ $\frac{|x|+1}{|x|-2}$ $\rightarrow R_y = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$

ب) $\frac{x^2+1}{x^2} = |x| + \frac{1}{|x|} \rightarrow |x| > 0 \rightarrow x \neq 0 \rightarrow R_y = [1, +\infty)$

۲) $\frac{x^2+2x-2}{x+3} \rightarrow \frac{x^2+2x-3+1}{x+3} = x-1 + \frac{1}{x+3} + 4-4$
 $\rightarrow x+3 + \frac{1}{x+3} - 4 \rightarrow R_y = (-\infty, -6] \cup [-2, +\infty)$

۳) $f(x) = \frac{x^2-x+\frac{1}{x}}{x^2-x+1} \cdot (\frac{x-\frac{1}{x}}{x-\frac{1}{x}+\frac{3}{x}})^2 \rightarrow D_f \rightarrow (\frac{x-\frac{1}{x}}{x-\frac{1}{x}+\frac{3}{x}})^2 + \frac{3}{x} \neq 0$
 $\rightarrow f(x) \geq 0 \rightarrow (\frac{x-\frac{1}{x}}{x-\frac{1}{x}+\frac{3}{x}})^2 < (\frac{x-\frac{1}{x}}{x-\frac{1}{x}+\frac{3}{x}})^2 + \frac{3}{x} \rightarrow f(x) < 1$
 $R_f = [0, 1)$

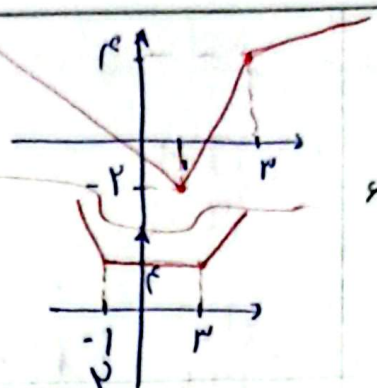
الف) $\sqrt{-x^2+x-1} \rightarrow -\frac{b}{2a} = \frac{1}{2} \rightarrow 0.5 \in (2, 3) \rightarrow \sqrt{(-\infty, 3)} \rightarrow [0, 3] \rightarrow R_y$

ب) $\sqrt{19x^2-19x} \rightarrow -\frac{b}{2a} = \frac{1}{2} \rightarrow 0.5 \in (2, -1) \rightarrow \sqrt{(-1, +\infty)} \rightarrow R_y = [-2, +\infty)$

۵) $\log(x^2-x+1) \rightarrow R \rightarrow \log(x^2-x+1) \rightarrow R \rightarrow \log(x^2-x+1) \rightarrow R$
 الف) $\log(x^2-x+1) \rightarrow R$
 ب) $\log(\frac{x^2+1}{x}) \rightarrow R \rightarrow \log(x^2-x+1) \rightarrow R$
 $\rightarrow x + \frac{1}{x} \rightarrow (-\infty, -1] \cup [1, +\infty) \rightarrow \log(x^2-x+1) \rightarrow R$
 $\rightarrow R_y = [1, +\infty)$

الف) $|2x-1| - |x-3| \rightarrow x-1 \mid 2x-4 \mid x+1$
 $\rightarrow \text{Ry. } [-1, +\infty)$

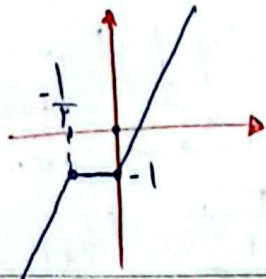
ب) $|x-3| + |x+1| \rightarrow 2x+1 \mid 2x-2$
 $\rightarrow \text{Ry. } [1, +\infty)$



$|x-2| - |2x+1| < 1 \rightarrow x+1 \mid -3x \mid -x-1$
 $\text{Ry. } (-\infty, -3) \cup [-\frac{1}{3}, +\infty)$

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

الف) $3x - |2x+1| |x| \rightarrow x+1 \mid -1 \mid 2x-1$

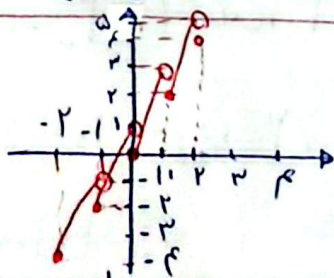


$\rightarrow \text{Ry. } \mathbb{R}$

الف) $[x] + [1-x] = [x] + [-x] + 1 \rightarrow$

ب) $3x - [x]$

$\rightarrow \text{Ry. } [-1, 1)$



$\rightarrow \text{Ry. } \{1, 2, 3\}$

الف) $\sin^2 x - \sin x + 1 \rightarrow \text{Ry. } [\frac{1}{4}, 3]$

ب) $\sin^2 x + \sin^2 x + 1 \rightarrow t^2 + t + 1 \rightarrow \text{Ry. } [1, 3]$