

نام و نام خانوادگی! میر حسین پاسخنامه تشریحی تکلیف شماره کلاس از د. ه. م.

الف) $y = \frac{|x|+1}{|x|-2}$ $\frac{y}{x} \mid \begin{array}{c} -\frac{1}{2} \\ +1 \\ -1 \\ + \end{array}$ $\downarrow$ $2|x|-2y = |x|+1$
 $|x| = \frac{2y+1}{2-1}$
 $|x| = 2y+1$
 $\downarrow$ باید از هر دو طرف به توان ۲ برسانیم

ب) $y = \frac{x^2+1}{|x|}$
 $x^2 - 2|x| + 1 = 0$
 $|x| = \frac{2 \pm \sqrt{4-4}}{2} = 1$
 $R_f = (-\infty, -1] \cup [1, +\infty)$

چون باید مثبت شود.
 $R_f = [2, +\infty)$

$y = \frac{x^2+2x-2}{x+3} \rightarrow x^2+2x-2 = y(x+3) \rightarrow x^2+(2-y)x-2-3y=0$
 $x = \frac{y-2 \pm \sqrt{(y-2)^2-4(-2-3y)}}{2} \rightarrow y^2-4y+4+1+12y \geq 0$
 $y^2+8y+5 \geq 0 \rightarrow (y+2)(y+4) \geq 0$
 $\downarrow \quad \downarrow$
 $-2 \quad -4$
 $\rightarrow R_f = (-\infty, -4] \cup [-2, +\infty)$

$y = \frac{x^2-x+\frac{1}{x}}{x^2-x+1}$ $2x^2-x+1 = x^2-x+\frac{1}{x} \rightarrow (x-1)x^2+(-x+1)x+x-\frac{1}{x} = 0$
 $\Delta < 0 \rightarrow R_f = \mathbb{R}$
 $\rightarrow x = \frac{y-1 \pm \sqrt{(y-1)^2-4(y-\frac{1}{y})}}{2}$
 $\downarrow$
 $-3y^2+3y \geq 0 \rightarrow y(-3y+3) \geq 0 \Rightarrow R_f = [0, 1]$

فرض کنیم یه بنابر حدش یعنی ۱+۱ است
 و تبع در ازای هیچ قدری به یه یه نشه پس
 به یه یه است: $R_f = [0, 1]$

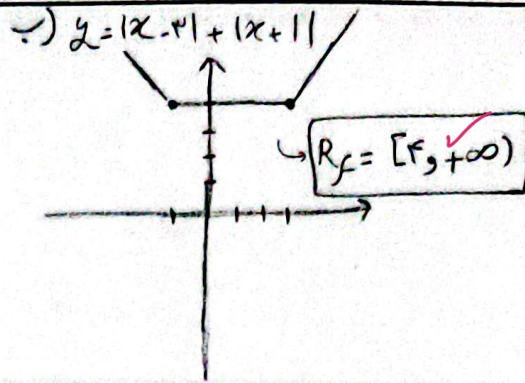
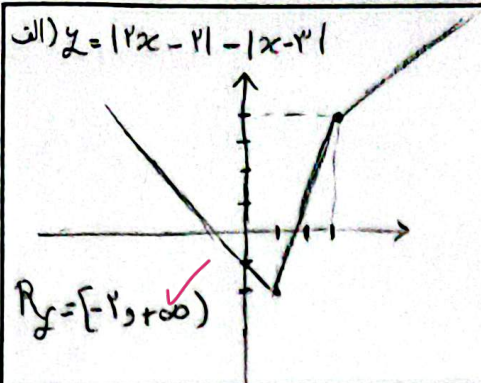
$\frac{1}{x^2} = \frac{1}{x^2} + \frac{1}{x^2}$
 میبایست از روش مربع هم استفاده کنیم

الف) $y = \sqrt{-x^2+4x-1}$
 $x_5 = \frac{-b}{2a} = \frac{-4}{-2} = 2$
 $\rightarrow y_5 = 3 \Rightarrow R_f = [0, \sqrt{3}]$

ب) $y = \sqrt{2x^2-11x}$
 $\frac{-b}{2a} = \frac{11}{4} = 2 \rightarrow y_5 = -1 \Rightarrow R_f = [-2, +\infty)$

الف) $y = \log(x^3-x+1)$
 $R_f = (-\infty, +\infty)$

ب) $y = \log\left(\frac{x^2+1}{x}\right)$ $x + \frac{1}{x} \geq 2$
 (با توجه به میانگین)
 $R_f = [\log 2, +\infty)$

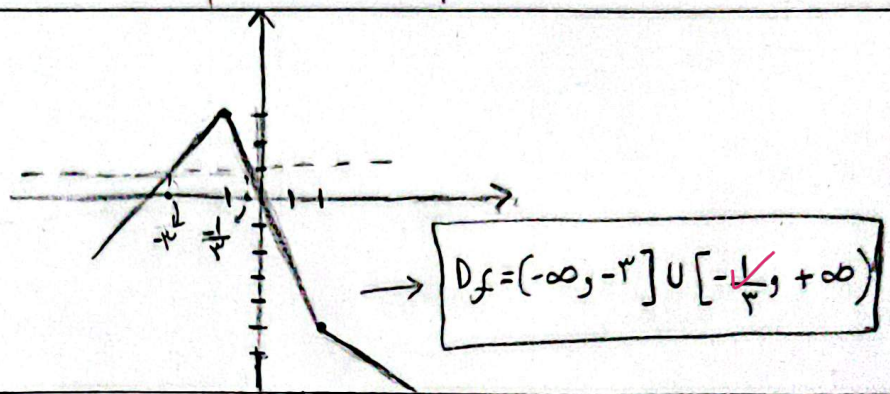


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4

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

$x - 2 - 2x - 2 = -x - 4$
 $-x + 2 + 2x + 2 = x + 4$



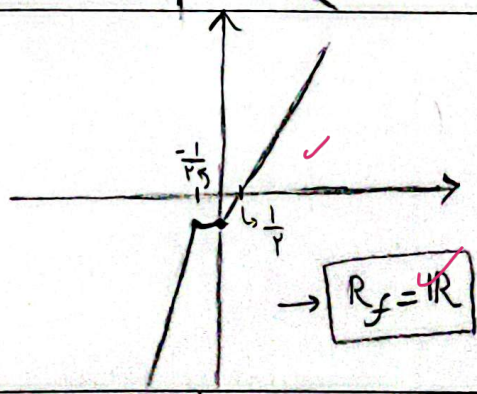
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7

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

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

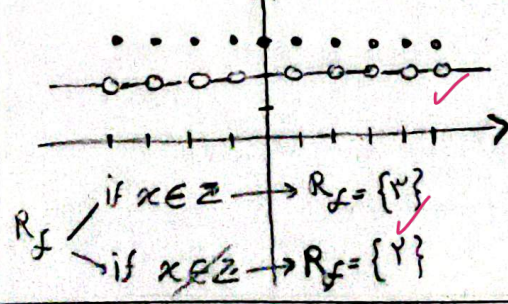
$3x + 2x + 1 - x$
 $4x + 1$



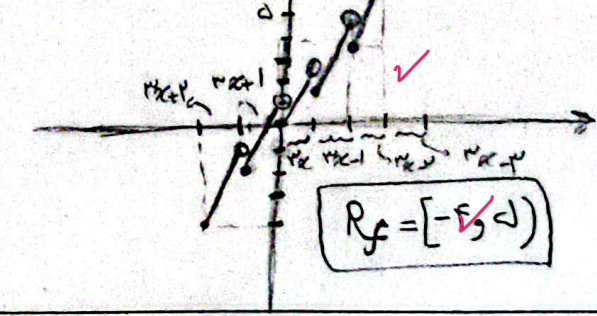
(2)

1

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



ب) $y = 3x - [x]$



(2)

9

الف) $y = \sin^2 x - \sin x + 1$

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

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

if $\sin x = \frac{1}{2} \rightarrow y = \frac{3}{4}$

$\rightarrow R_f = [\frac{3}{4}, 3]$

ب) $y = \sin^2 x + \sin^2 x + 1$

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

if $\sin^2 x = 0 \rightarrow y = 1$

if $\sin^2 x = \frac{1}{4} \rightarrow y = \frac{5}{4}$

$\rightarrow R_f = [1, 3]$

(2)

10