

19, 25

دولت‌دوم دنته سه بینه ما

عسل کاغذی

سوال 1 ←

$$\lim_{|x| \rightarrow +\infty} \frac{|x|+1}{|x|-2} = 1$$

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

مقدارهای بی نهایت پیدا می‌شود، تو بزنه نیست!

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

ب) $\frac{x^2+1}{|x|} \rightarrow |x| + \frac{1}{|x|} \rightarrow [2, +\infty)$

سوال 2 ←

$$y = \frac{x^2+2x-2}{x+3} \xrightarrow{\text{تقسیم}} \frac{x^2+2x-3+1}{x+3}$$

$$\rightarrow x-1 + \frac{1}{x+3} \rightarrow x+3 + \frac{1}{x+3} \rightarrow Rf = (-\infty, -4] \cup (-2, +\infty)$$

سوال 3 ←

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

$$\rightarrow x^2(y-1) + x(1-y) - \frac{1}{y} \geq 0$$

$$\Delta \geq 0 \rightarrow b^2 - 4ac \rightarrow y^2 - 2y + 1 - (1(y-1)(y+\frac{1}{y}))$$

$$\rightarrow -2y(y-1) \geq 0 \rightarrow \begin{array}{c|c} 0 & 1 \\ -1 & + \\ + & - \end{array}$$

سوال 4 ←

$$x^2 \rightarrow Rf = [0, +\infty)$$

مقدارهای بی نهایت پیدا می‌شود

$$Rf = [0, +\infty)$$

سوال 5 ←

$$y = \sqrt{-x^2+6x-1} \rightarrow \frac{-b}{2a} = \frac{-6}{-2} = 3 \rightarrow -6+18-1=11$$

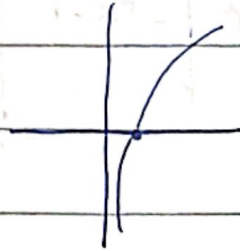
$$\rightarrow \sqrt{(-\infty, 3]} \rightarrow [0, +\sqrt{11}]$$

ب) $\sqrt[3]{x^3 - 12x} \rightarrow -\frac{b}{3a} = \frac{+12}{3} = 4 \rightarrow 12 - 12 = 0$
 $\rightarrow [-12, +\infty) \rightarrow [-12, +\infty)$

سوال ٧

انف) $\log_2(x^3 - x + 12)$ $\rightarrow R_f = \mathbb{R}$ ✓

(٢)

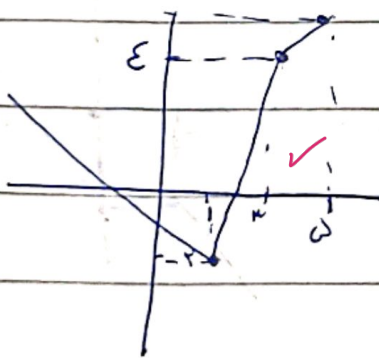


ب) $\log_2\left(\frac{x^2+1}{x}\right) \rightarrow x + \frac{1}{x}$
 $\rightarrow x + \frac{1}{x} \rightarrow \begin{cases} (2, +\infty) \\ (-\infty, -2) \end{cases} \rightarrow \mathbb{R} \setminus [-2, 2]$

سوال ٦

انف) $y = |2x - 2| - |x - 3|$

(٢)



1	3
$-x - 1$	$2x - 5$
$x + 1$	

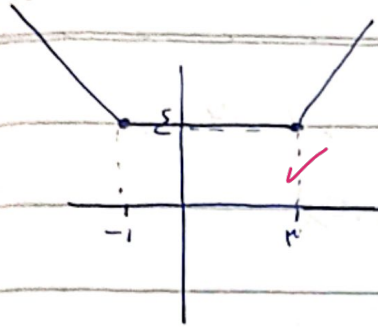
$R_f \rightarrow [-2, +\infty)$

ب) $y = |x - 3| + |x + 1|$

-1	3
$2 - 2x$	$2x - 2$
x	

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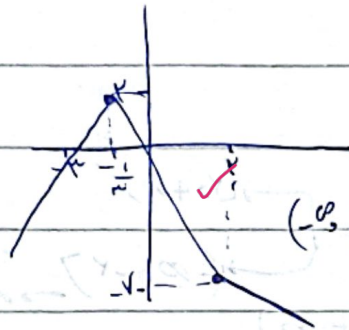
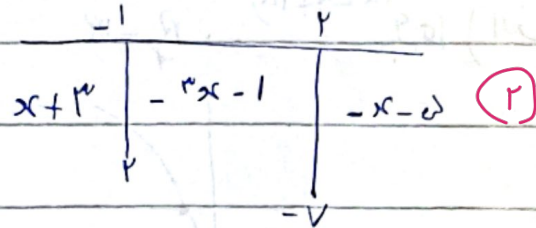


$$R_f = [1, +\infty)$$

سوال ۷ ←

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

$$\hookrightarrow |x-2| - |3x+2| - 1 < 0$$



$$(-\infty, -1) \cup [-\frac{1}{3}, +\infty)$$

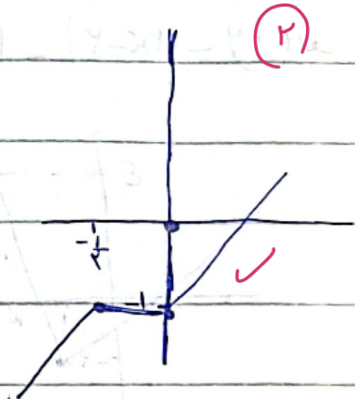
در بازه و میزگر از هنر

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

سوال ۸ ←



$$R_f = R \checkmark$$

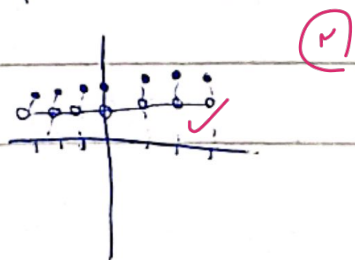


$$9 = [x] + [3-x] = [x] + [-x] + 3$$

سوال ۹ ←

$$R_f = \{2, 2.8\}$$

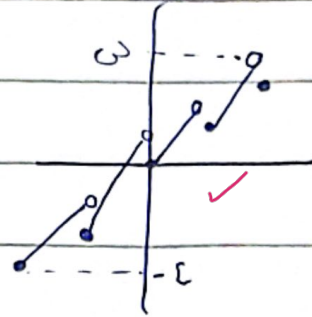
$$x \in [2, 3] \\ x \notin [2, 2.8]$$



ب) $f(x) = [x]$

$-2 \leq x < -1 \rightarrow f(x) = -2$
 $-1 \leq x < 0 \rightarrow f(x) = -1$
 $0 \leq x < 1 \rightarrow f(x) = 0$
 $1 \leq x < 2 \rightarrow f(x) = 1$
 $x = 2$

$$Rf = [-2, 2)$$



سوال ۲

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

$\sin^2 x = 1 \rightarrow 1 - 1 + 1 = 1$
 $\sin x = -1 \rightarrow 1 + 1 + 1 = 3$
 $-\frac{b}{2a} = \frac{1}{2} \rightarrow \frac{1}{2} - \frac{1}{2} + 1 = 1$

$\therefore Rf = [1, 3]$

ب) $y = \sin^2 x + 8 \sin^4 x + 1$

$\sin^2 x = 0 \rightarrow 0 + 0 + 1 = 1$
 $\sin^2 x = 1 \rightarrow 1 + 1 + 1 = 3$
 $-\frac{b}{2a} = -\frac{1}{2} < x$

$\therefore Rf = [1, 3]$