

19.10

نام و نام خانوادگی شماره کلاس پاسخنامه تشریحی تکلیف شماره ۳

$$y = \frac{x^2 + 2}{x - 1} \Rightarrow yx - y = x^2 + x + 2 \Rightarrow x^2 + (1 - y)x + 2 + y = 0 \rightarrow x = \frac{-(1-y) \pm \sqrt{(1-y)^2 - 4(2+y)}}{2}$$

$$(1-y)^2 - 4(2+y) \geq 0 \Rightarrow y^2 - 6y - 7 \geq 0 \Rightarrow y \in (-\infty, -1] \cup [7, +\infty) \checkmark$$

$$\Rightarrow R_f = (-\infty, -1] \cup [7, +\infty)$$

الف) $y = 2x^2 - 5x + 1$

$$-\frac{\Delta}{4a} \rightarrow -\frac{(17)}{4} \Rightarrow R_f = [-\frac{17}{4}, +\infty)$$

ج) $\rightarrow R =$ برد $\Rightarrow$ عبارت زیر رادیکال درجه ۳ است و برای دلتا

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

ب) $y = \sqrt{-x^2 + 4x - 5}$

$$R_f = \sqrt{(-\infty, 4]} \Rightarrow R_f = [0, 2]$$

د) عبارت جذبی لگاریتم درجه ۳ است و برای دلتا تنها مقادیر مثبت است که به ازای مقادیر مثبت، برد این عبارت R_f است

الف) $y = \frac{3x+1}{x^2-4}$

$$x \in \mathbb{R} - \{\pm 2\} \Rightarrow R_f = \mathbb{R} - \{\frac{1}{4}\}$$

ج) $y = \frac{x^2 + 1}{\sqrt{x^2 + 3}} \Rightarrow y = \sqrt{x^2 + 3} + \frac{1}{\sqrt{x^2 + 3}}$

$$\Rightarrow R_f = [\sqrt{3} + \frac{1}{\sqrt{3}}, +\infty)$$

ب) $y = \sqrt{\frac{4x+1}{x-2}}$

$$R_f = \sqrt{\mathbb{R} - \{\frac{1}{4}\}} \Rightarrow R_f = [0, +\infty) - \{\frac{1}{2}\}$$

د) $y = x^2 + \frac{1}{x^2 + 4} + 4 - 4 = x^2 + \frac{1}{x^2 + 4} - 4$

$$\Rightarrow R_f = [4 + \frac{1}{4}, +\infty) - 4 = [\frac{17}{4}, +\infty)$$

الف) $y = \frac{3x^2 + 4}{x^2 - 1}$

$$\Rightarrow x^2 = \frac{y+4}{y-3} \Rightarrow x = \pm \sqrt{\frac{y+4}{y-3}}$$

$$\frac{y+4}{y-3} \geq 0 \Rightarrow R_f = (-\infty, -4] \cup (3, +\infty)$$

ب) $y = \frac{3x^2 + 4}{x^2 - 1}$

$$x^2 \leq 1 \Rightarrow x^2 = 0 \Rightarrow y = -4$$

$$x^2 = +\infty \Rightarrow y = 3 \rightarrow$$

$$\Rightarrow R_f = (-\infty, -4] \cup (3, +\infty)$$

الف) $y = \frac{2 \sin x - 1}{\sin x + 3}$

$$\Rightarrow \sin x = \frac{y+1}{y-2}$$

$$\Rightarrow x = \arcsin \frac{y+1}{y-2}$$

$$\Rightarrow -1 \leq \frac{y+1}{y-2} \leq 1 \Rightarrow \begin{cases} 0 \leq \frac{y+1}{y-2} \leq 1 \Rightarrow y \in [-\frac{1}{2}, 2) \rightarrow (1) \\ -1 \leq \frac{y+1}{y-2} < 0 \Rightarrow y \in (-\infty, \frac{1}{2}] \cup (2, +\infty) \rightarrow (2) \end{cases}$$

ب) $\sin x = -1 \Rightarrow y = \frac{-3}{1} = -3$

$\sin x = 1 \Rightarrow y = \frac{1}{1} = 1$

$$\Rightarrow R_f = [-\frac{3}{2}, \frac{1}{2}]$$

$$R_f = [-\frac{3}{2}, \frac{1}{2}]$$

$$f(x) = \frac{x^2 - x + \frac{1}{4}}{x^2 - x + 1}$$

$$x^2 - x = -\frac{1}{4} \rightarrow f(x) = 0$$

$$x^2 - x = +\infty \rightarrow f(x) = 1 \quad \Rightarrow R_f = [0, 1)$$

$$x^2 - x + 1 \rightarrow \text{مربع کامل}$$

بازوی به مرکز: $x^2 - x$ بین $[-\frac{1}{4}, +\infty)$ و $-\frac{1}{4}$ و $+\infty$

$$D_f = \mathbb{R}$$

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

$$f(0) = -1$$

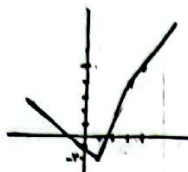
$$f(1) = -2$$

$$f(2) = 4$$

$$f(3) = 0$$

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

$$2x-2=0 \Rightarrow x=1 / x-3=0 \Rightarrow x=3$$



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

$$\begin{cases} x-3=0 \Rightarrow x=3 \\ x+1=0 \Rightarrow x=-1 \end{cases} \Rightarrow \text{مقدار} = 4$$



$$\rightarrow R_g = [4, +\infty)$$

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

$$x-2=0 \Rightarrow x=2$$

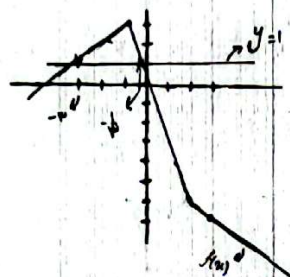
$$2x+2=0 \Rightarrow x=-1$$

$$f(-1) = 2$$

$$f(2) = 3$$

$$f(2) = -4$$

$$f(-1) = -2$$



$$-3x=1$$

$$\Rightarrow x = -\frac{1}{3}$$

$$x+2=1$$

$$\Rightarrow x = -1$$

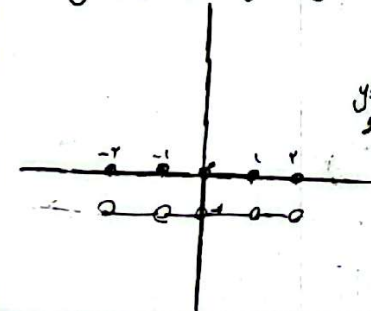
$$\Rightarrow |x-2| - |2x+2| \leq 1$$

$$x \in (-\infty, 2] \cup [-\frac{1}{3}, +\infty)$$

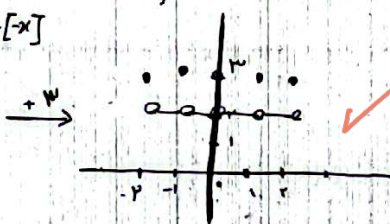
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$$y = [x] + [3-x] \Rightarrow y = [x] + [-x] + 3 \Rightarrow R_f = \{3, 4\}$$



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



$$y = 3x - [x] \quad , [-2, 2]$$

$$-2 \leq x < -1 \Rightarrow y = 3x + 2$$

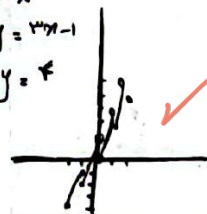
$$-1 \leq x < 0 \Rightarrow y = 3x + 1$$

$$0 \leq x < 1 \Rightarrow y = 3x$$

$$1 \leq x < 2 \Rightarrow y = 3x - 1$$

$$x = 2 \Rightarrow y = 4$$

$$R_f = [-4, 5)$$



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

$$\sin x = -1 \Rightarrow y = 3$$

$$\sin x = 1 \Rightarrow y = 1 \rightarrow R_f = [\frac{3}{4}, 3]$$

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

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

$$\sin^2 x = 0 \Rightarrow y = 1$$

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

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

$$\rightarrow R_f = [1, 2]$$

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