

پاسخنامه تشریحی تکلیف شماره ۳ کلاس روز
 نام و نام خانوادگی
 ۱۹

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

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

$$(1 - y)^2 - 4(y + 2) \geq 0 \rightarrow 1 + y^2 - 2y - 4y - 8 \geq 0 \Rightarrow y^2 - 6y - 7 \geq 0 \quad (y - 7)(y + 1)$$

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

$$1) y = 2x^2 - dx + 1$$

$$\text{ext} \mid x \rightarrow \frac{-b}{2a} = \frac{d}{4}$$

$$y \rightarrow 2\left(\frac{d}{4}\right)^2 - \frac{2d}{4} + 1 = \frac{d^2}{8} - \frac{d}{2} + 1 = \frac{d^2 - 4d + 8}{8}$$

$$R_f = \left[-\frac{d^2 - 4d + 8}{8}, +\infty\right)$$

$a > 0 \rightarrow$ دمانه
 سیمی و جابلا و
 min سیمی دارد

$$2) y = \sqrt{-x^2 + 4x - d}$$

$$\text{ext} \mid x \rightarrow \frac{-b}{2a} = 2$$

$$y \Rightarrow \sqrt{-x^2 + 4x - d} \rightarrow R_f = (-\infty, 2]$$

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

$a < 0$
 max سیمی دارد

$$c) y = \sqrt{x^V - 3x^V + 6x + 1}$$

$$x^V - 3x^V + 6x + 1 \rightarrow R = \mathbb{R}$$

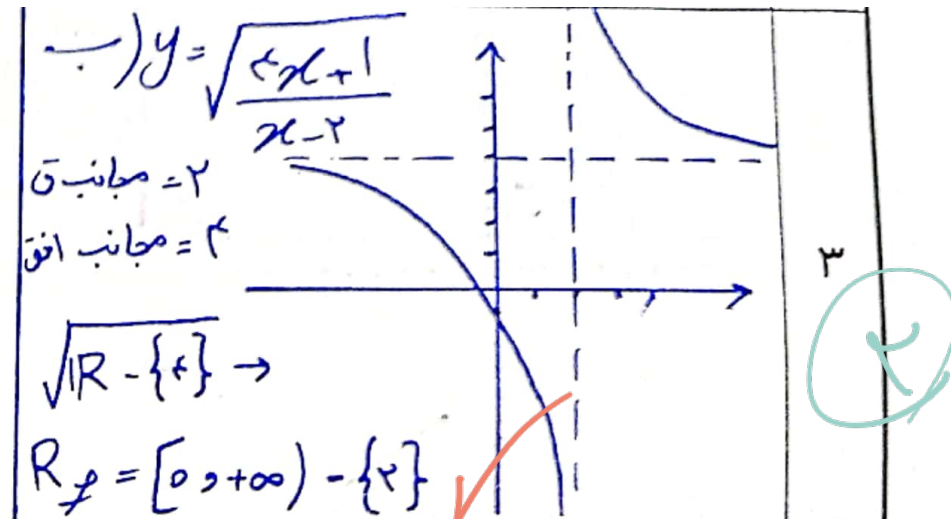
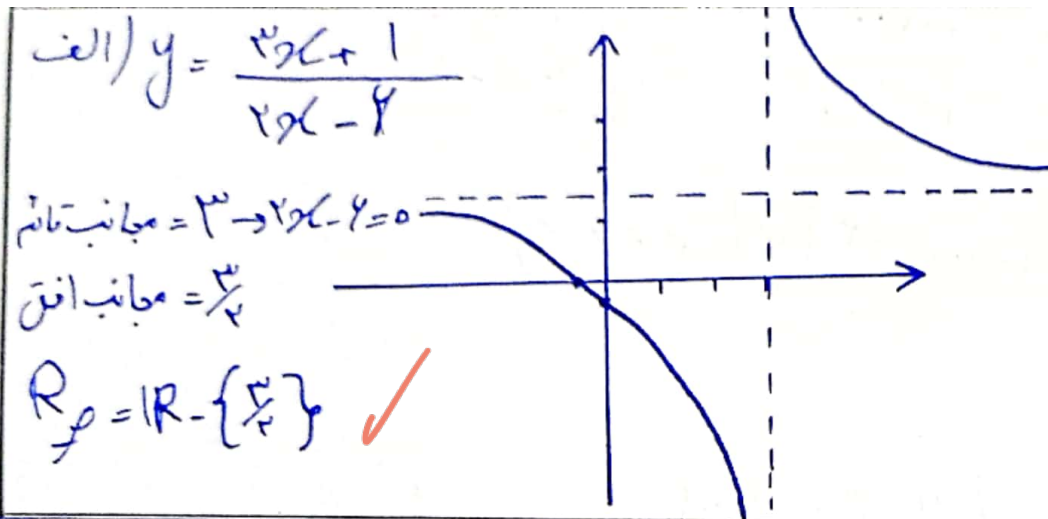
$$\sqrt{\mathbb{R}} \rightarrow \boxed{R_{\neq} = [0, +\infty)} \quad \checkmark$$

$$d) \text{Log}(x^V - 4x^V + Vx + 6)$$

$$x^V - 4x^V + Vx + 6 \rightarrow R = \mathbb{R}$$

$$\text{Log}^{\mathbb{R}} \rightarrow \mathbb{R} \rightarrow \boxed{R_{\neq} = \mathbb{R}} \quad \checkmark$$

⑧



ج) $y = \frac{x^2+4}{\sqrt{x^2+3}} \rightarrow \frac{x^2+3}{\sqrt{x^2+3}} + \frac{1}{\sqrt{x^2+3}} = \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}}$

$R_f = \left[\sqrt{3} + \frac{1}{\sqrt{3}}, +\infty \right) = \left[\frac{4}{\sqrt{3}}, +\infty \right)$ ✓

دستی که a بتواند
① شود در غیر این صورت
بردار از کترین مقدار $a + \frac{1}{a}$ به بعد است

$a + \frac{1}{a} \rightarrow [2, +\infty)$

د) $y = x^2 + \frac{1}{x^2+4} \rightarrow y+4 = x^2+4 + \frac{1}{x^2+4} \rightarrow R(y+4) = \left[4 + \frac{1}{4}, +\infty \right)$

$R_f = \left[\frac{17}{4}, +\infty \right)$ ✓

$$y = \frac{rx^r + c}{x^r - 1}$$

$$\begin{aligned} \text{III} \rightarrow x^r = 0 &\rightarrow y = -c \\ x^r = +\infty &\rightarrow y = r \end{aligned}$$

$$\begin{array}{c} -c \quad r \\ \hline \end{array} \rightarrow R_p = (-\infty, -c] \cup (r, +\infty) \quad \checkmark$$



r

$$y = \frac{rx^r + c}{x^r - 1} \rightarrow x^r = -\frac{-y - c}{y - r} \rightarrow x^r = \frac{y + c}{y - r} \checkmark \rightarrow x = \pm \sqrt{\frac{y + c}{y - r}} \checkmark$$

$$\frac{y + c}{y - r} \geq 0 \rightarrow \begin{array}{c} -c \\ + \end{array} \quad \begin{array}{c} r \\ - \end{array} \rightarrow \boxed{R = (-\infty, -c] \cup (r, +\infty)} \quad \checkmark$$

$$y = \frac{2\sin x - 1}{\sin x + 3} \xrightarrow{I} \sin x = -\frac{2y+1}{y-2} \rightarrow \sin x = \frac{2y+1}{2-y}$$

$$-1 \geq \frac{2y+1}{2-y} \geq 1 \rightarrow y \geq -\frac{3}{2}, y \leq \frac{1}{2} \rightarrow R_f = \left[-\frac{3}{2}, \frac{1}{2}\right] \quad \checkmark$$

فاصله نه بندبند

$$\text{II} \rightarrow \sin x = -1 \rightarrow -\frac{3}{2} \quad \sin x = 1 \rightarrow \frac{1}{2} \rightarrow R_f = \left[-\frac{3}{2}, \frac{1}{2}\right]$$

$$\frac{-\frac{3}{2}}{\quad} \quad \frac{1}{2}$$

1, 10

5

$$f(x) = \frac{x^2 - x + \frac{1}{2}}{x^2 - x + 1} \rightarrow D_f = \mathbb{R}$$

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

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

$$y^2 - 2y + 1 - 4y^2 + 4y - 1 \geq 0 \rightarrow -3y^2 + 2y \geq 0 \rightarrow -y^2 + y \geq 0 \quad y(-y+1) \geq 0$$

$$R = [0, 1]$$

$$\text{الف) } |2x-2| - |x-3|$$

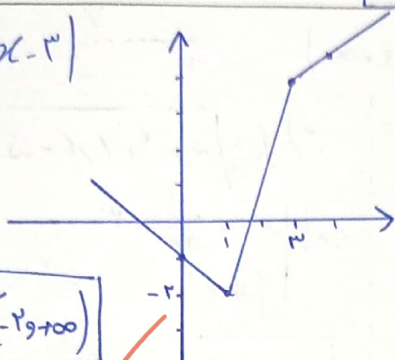
$$x=1 \rightarrow y=-2$$

$$x=3 \rightarrow y=4$$

$$x=0 \rightarrow y=-1$$

$$x=4 \rightarrow$$

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



$$\text{ب) } y = |x-3| + |x+1|$$

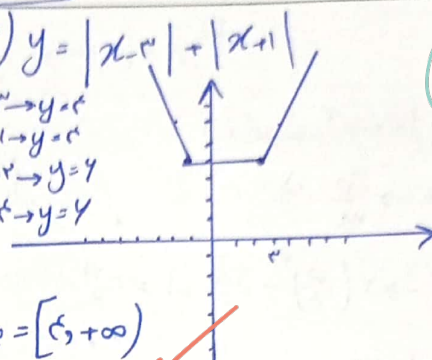
$$x=3 \rightarrow y=4$$

$$x=-1 \rightarrow y=0$$

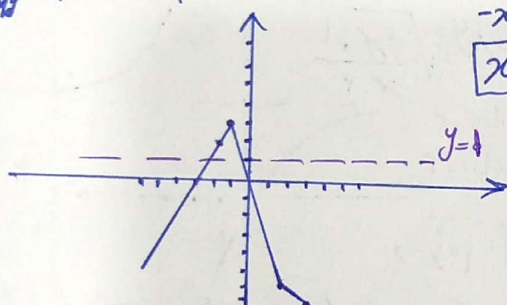
$$x=-3 \rightarrow y=4$$

$$x=4 \rightarrow y=8$$

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



$$|x-2| - |2x+2| \leq 1 \rightarrow \begin{matrix} -x+2+2x+2 & -x+2-2x-2 & x-2-2x-2 \\ x+4 & -3x-4 & -x-4 \end{matrix}$$

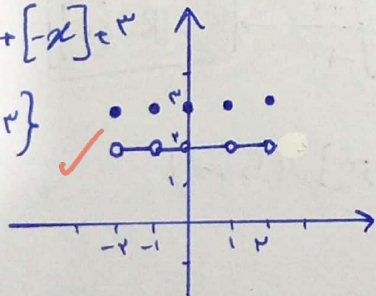


$$\rightarrow (-\infty, -3] \cup [\frac{1}{3}, +\infty)$$

$$\text{الف) } y = [x] + [2-x]$$

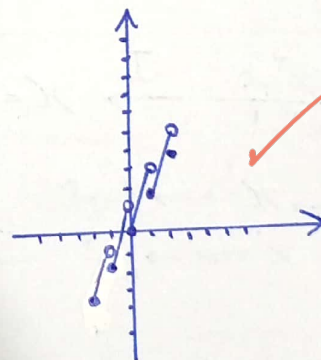
$$\rightarrow [x] + [-x] \leq 2$$

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



$$\text{ب) } y = 2x - [x]$$

$$R_f = [-1, 2)$$



$$\text{الف) } \sin^2 x - \sin x + 1$$

$$\begin{matrix} \uparrow & 1-1+1=1 \\ \downarrow & 1+1+1=3 \\ \text{ب) } & \frac{1}{4} \rightarrow \frac{1}{2} \rightarrow \frac{1}{4} - \frac{1}{4} + 1 \rightarrow \frac{1}{2} \end{matrix}$$

$$R_f = [\frac{1}{4}, 3]$$

$$\text{ب) } y = \sin^2 x + \sin^2 x + 1$$

$$\begin{matrix} \uparrow & 1+1+1=3 \\ \downarrow & 0+0+1=1 \\ \text{ب) } & \frac{1}{4} \rightarrow \frac{1}{2} \rightarrow \frac{1}{4} \end{matrix}$$

$$R_f = [1, 3]$$