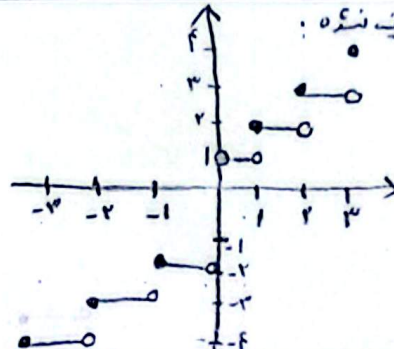


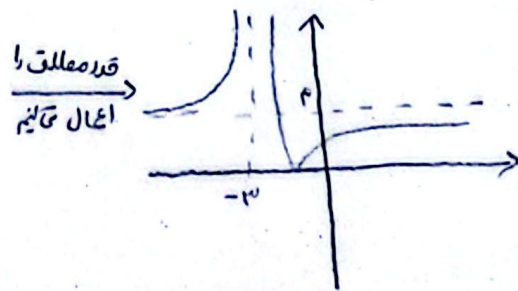
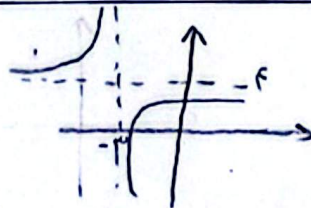
الف) $\frac{2 \sin^2(x + \frac{\pi}{2}) - 1}{[0, 2]} \rightarrow R_f = [-1, 1]$

ب) $\frac{3 \cos^2 x - 4}{[-\pi, \pi]} \rightarrow R_f = [-1, 1]$

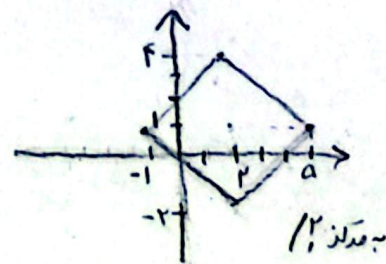
این تابع در $x=0$ نقطه نشانه :
 $-3 \leq x < -2 \rightarrow [x] = -3 \rightarrow -4$
 $-2 \leq x < -1 \rightarrow [x] = -2 \rightarrow -3$
 $-1 \leq x < 0 \rightarrow [x] = -1 \rightarrow -2$
 $0 \leq x < 1 \rightarrow [x] = 0 \rightarrow -1$
 $1 \leq x < 2 \rightarrow [x] = 1 \rightarrow 0$
 $2 \leq x < 3 \rightarrow [x] = 2 \rightarrow 1$
 $x = 3 \rightarrow 4$



$y = \frac{x+1}{x+3}$ $\rightarrow$ $y = 1$ $\rightarrow$ $x+1 = x+3 \rightarrow 1=3$ (ممنوع)
 $y = -3$ $\rightarrow$ $x+1 = -3(x+3) \rightarrow x+1 = -3x-9 \rightarrow 4x = -10 \rightarrow x = -2.5$



$y > 1$ $x > 2$	$y < 1$ $x > 2$	$y > 1$ $x < 2$	$y < 1$ $x < 2$
$x - 2 + y - 1 = 3$	$x - 2 + 1 - y = 3$	$2 - x + y - 1 = 3$	$2 - x + 1 - y = 3$
$\rightarrow y = 4 - x$	$\rightarrow y = x - 4$	$\rightarrow y = x + 2$	$\rightarrow y = -2$



الف) $x + \frac{1}{x} \leq -2$ $\rightarrow$ $x + \frac{1}{x} \geq 2$ $\rightarrow$ $(\sqrt{x + \frac{1}{x}}) \geq \sqrt{2} \pm 1 \rightarrow \sqrt{x + \frac{1}{x}} + 1 \geq \sqrt{2} + 1 \rightarrow (\sqrt{x + \frac{1}{x}} + 1)^2 \geq (\sqrt{2} + 1)^2 \rightarrow x + \frac{1}{x} + 2 \geq 2 + 2\sqrt{2} \rightarrow x + \frac{1}{x} \geq 2\sqrt{2}$
 $\rightarrow R_f = [2 + 2\sqrt{2}, +\infty)$

ب) $y = -\sin^2 x + \sin x + 2$ $\rightarrow$ $\sin x = 1 \rightarrow 4$
 $\rightarrow \sin x = -1 \rightarrow 0$
 $\rightarrow \sin x = \frac{1}{2} \rightarrow 2$
 $\Rightarrow R_f = [0, 4]$

$$Df = \{1, r, v, \dots, q\}$$

$$f(1) = \frac{r \cdot q}{r}$$

$$f(r) = \frac{r \cdot 1}{r}$$

$$f(v) = \frac{r \cdot v}{r}$$

$$f(q) = \frac{r \cdot q}{r}$$

$$\vdots$$

$$f(1) = \frac{r \cdot 1}{r}$$

$$e^x = \left(\frac{r \cdot q}{r} + \frac{r \cdot 1}{r} \right) \times \frac{q}{r} = (v \cdot 1)$$

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$$ax^2 + bx + c = 0, \quad \frac{r}{-1 +} \rightarrow a = 0, \quad f(r) = 0 \rightarrow rb + c = 0 \rightarrow c = -rb$$

$$f(r) = 1 \rightarrow rb + c = 1 \quad \xrightarrow{c = -rb} b = 1 \rightarrow c = -r$$

$$\Rightarrow g(x) = \sqrt{x^2 + r} \rightarrow Rg = [r, +\infty)$$

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$$\frac{x^3 - f_2}{x + r} \rightarrow \frac{x(x-r)(x+r)}{(x+r)} = x^2 - rx, \quad y \neq 1 \rightarrow x \neq a, b \quad \text{یعنی اگر جای 2، a، b بنویسیم، عرض 1 بدست می آید}$$

$$\rightarrow x(x-r) = 1 \quad \xrightarrow{\Delta = r^2} x \rightarrow -r = a$$

$$c = -1 \quad c = R = [-1, +\infty) - \{1\} \Leftarrow \quad x_2 = 1 \rightarrow y_2 = -1 \quad \text{تابع } x^2 - rx \text{ در } x = 1 \text{ مقدار 0 است}$$

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$$f\left(\frac{a+b}{r}\right) = f(c) = r$$

$$\sqrt[3]{(x-r)^3} \rightarrow \sqrt{x^3 - 12x^2 + 12x} \rightarrow \begin{matrix} b=12 \\ a=-4 \end{matrix} \rightarrow Df = [a, b] \rightarrow Df = [-4, 12]$$

$$\left. \begin{matrix} f(-4) = -1 \\ f(12) = 1 \end{matrix} \right\} \rightarrow Rf = [-1, 1]$$

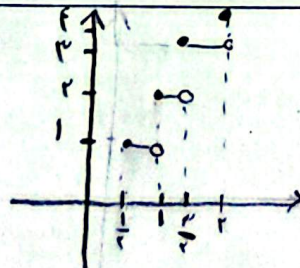
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$$\frac{1}{r} \leq x < 1 \quad \begin{matrix} [x] = 0 \\ [x + \frac{1}{r}] = 1 \end{matrix} \quad 1$$

$$1 \leq x < \frac{r}{r} \quad \begin{matrix} [x] = 1 \\ [x + \frac{1}{r}] = 1 \end{matrix} \quad 2$$

$$\frac{r}{r} \leq x < r \quad \begin{matrix} [x] = 1 \\ [x + \frac{1}{r}] = 1 \end{matrix} \quad 3$$

$$x = r \rightarrow r$$



۳ باره جدا

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