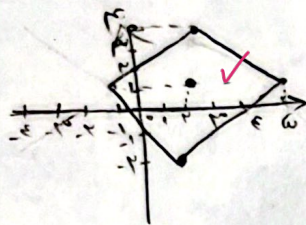
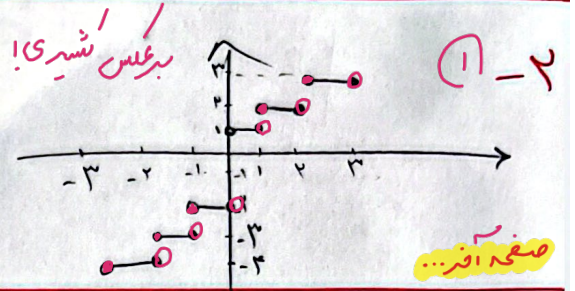
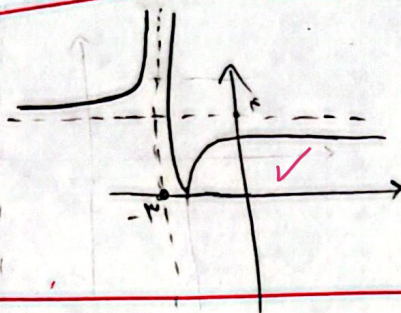


الف)  $2 \sin^2(x + \frac{\pi}{4}) - 1 \Rightarrow R_f = [-1, 1]$  ب)  $[-3, 3] - 4 = [-7, -1] = R_f$  ۱-۲

جواب هارو با دست بزن



۱)  $x > 2, x \geq 1 \Rightarrow (x-2) + (x-1) = 3 \Rightarrow x + x = 6 \Rightarrow x = 3$   
 ۲)  $x > 2, x < 1 \Rightarrow (x-2) - (x-1) = 3 \Rightarrow x - x - 2 + 1 = 3 \Rightarrow -1 = 3$  (no solution)  
 ۳)  $x < 2, x \geq 1 \Rightarrow -(x-2) + (x-1) = 3 \Rightarrow -x + 2 + x - 1 = 3 \Rightarrow 1 = 3$  (no solution)  
 ۴)  $x < 2, x < 1 \Rightarrow -(x-2) - (x-1) = 3 \Rightarrow -x + 2 - x + 1 = 3 \Rightarrow -2x + 3 = 3 \Rightarrow -2x = 0 \Rightarrow x = 0$

الف)  $x + \frac{1}{x} = t \Rightarrow \sqrt{x + \frac{1}{x}} \sqrt{x + \frac{1}{x}} + 2 \sqrt{t} = \sqrt{x + \frac{1}{x}} \Rightarrow \sqrt{t}(\sqrt{t} + 1) = 0 \Rightarrow t = -1$   
 $2 + \frac{1}{x} = 0 \Rightarrow \frac{2x + 1}{x} = 0 \Rightarrow x = -\frac{1}{2}$

ب)  $3 + 3 \sin x - \sin x - \sin x \rightarrow -\sin^2 x + 2 \sin x + 3$   
 $\max \rightarrow -1 + 2 + 3 = 4$   
 $\min \rightarrow -1 - 2 + 3 = 0$   
 $R_f = [0, 4]$

$\begin{cases} 2x + 3a + b + c = 1 \\ 3x + 4a + 2b + c = 0 \end{cases}$   
 $4a - c = 1 \Rightarrow 4a - 1 = c$   
 $9a + 3b + 4a = 1 \Rightarrow 13a + 3b = 1 \Rightarrow 13a + 3(1-4a) = 1 \Rightarrow 13a + 3 - 12a = 1 \Rightarrow a = -2$   
 $b = 1 - 4a = 9$   
 $c = 4a - 1 = -9$

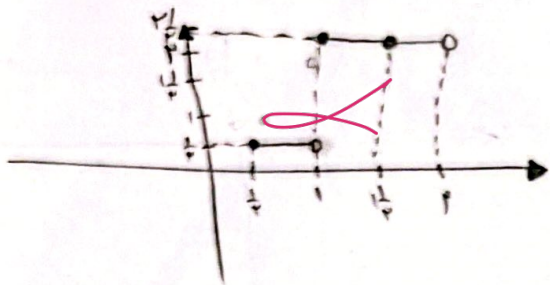
$\Delta < 0 \Rightarrow R_f = \emptyset$

$(1, \frac{29}{3}), (2, \frac{28}{3}), (3, -9), (4, -\frac{26}{3}), (5, -\frac{25}{3}), (6, -1)$   
 $(-7, -\frac{23}{3}), (8, -\frac{22}{3}), (9, -7) \Rightarrow -29 + \dots + -21 = -100$

$b^2 - 4ac = 0$   
 $b^2 = 4ac$   
 $1 + 2a - 1a = -4a + 2a \Rightarrow a = 0$   
 $a^2 - 2a + 1 = 0 \Rightarrow (a-1)^2 = 0 \Rightarrow a = 1$

$x^2 + ax + b - 1 \Rightarrow (x+2)^2$   
 $a = -4, b = 12$   
 $R_f = [-4, 12]$   
 $f(-4) = 1, f(12) = 1$   
 $R_f = [-4, 12]$

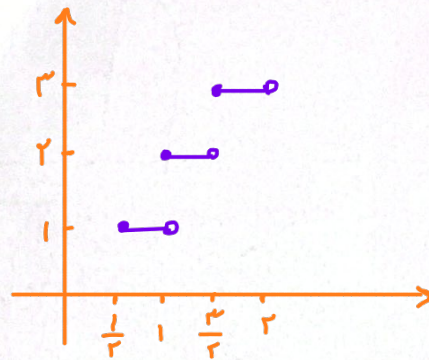
$\frac{x^3 - 4x}{x+2} = 1 \Rightarrow x^3 - 4x = x + 2 \Rightarrow x^3 - 5x - 2 = 0$   
 $(x-2)(x+2)^2 = 0 \Rightarrow x = 2, x = -2$   
 $f(\frac{2}{-1}) = \frac{-8 + 8}{-1} = 0$   
 $c = -1$



$$f(x) + \frac{1}{x} = f(x)$$

$\Rightarrow$  هیچ پارامتری نداریم  $\frac{-10}{0}$

$$y = \begin{cases} \frac{1}{x} \leq x < 1 \rightarrow y = 0 + 1 = 1 \\ 1 \leq x < \frac{2}{x} \rightarrow y = 1 + 1 = 2 \\ \frac{2}{x} \leq x < 2 \rightarrow y = 1 + 2 = 3 \end{cases}$$



سه پارامتر خطی

الف)  $f(x) = x + \frac{1}{x} + \sqrt{x + \frac{1}{x}}$

-۵

$$\begin{cases} \min \square = \sqrt{2} \rightarrow f(x) = 2 + 2\sqrt{2} \\ \max \square \sim \infty \rightarrow f(x) = +\infty \\ \square = -\frac{b}{a} = -1 \quad x \end{cases}$$

$$\Rightarrow R_f = [2 + 2\sqrt{2}, +\infty)$$

$$D_f = \{1, 2, \dots, 9\} \rightarrow R_f = \left\{ \frac{21}{3}, \frac{22}{3}, \dots, \frac{29}{3} \right\}$$

$$y = -\frac{1}{3}x + 10$$

-۶

رتبه‌های صحیح

$$S_n = \frac{n}{r} (a_1 + a_n) \Rightarrow S_n = \frac{9}{r} \left( \frac{21}{3} + \frac{29}{3} \right) = (75)$$

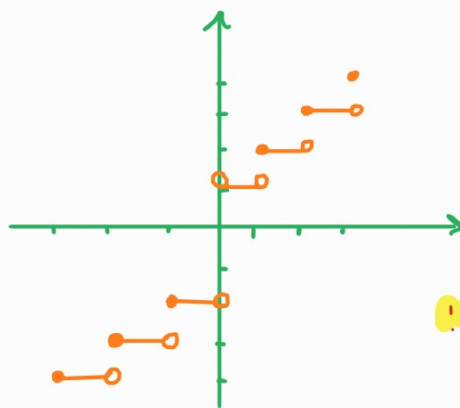
۷- با توجه به دامنه، زیر ادیکال یک خط با شیب مثبت بوده یعنی  $a=0$  است و نقطه  $(2, 0)$  هم در معادله خط صدق می‌کند...

$$\begin{cases} (2, 0) \rightarrow 2b + c = 0 \\ (3, 1) \rightarrow 3b + c = 1 \end{cases} \rightarrow b = 1, c = -2$$

$$g(x) = \sqrt{x^2 + 4} \rightarrow \left. \text{ext} \right|_x^0 \Rightarrow R_g = \sqrt{[4, +\infty)} = [2, +\infty)$$

$$y = \begin{cases} [x] + 1 & x > 0 \\ [x] - 1 & x < 0 \end{cases}$$

$\Rightarrow$



صفر تعریف شده است