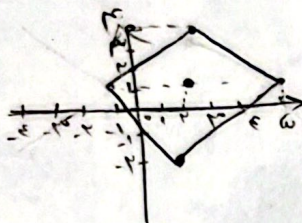
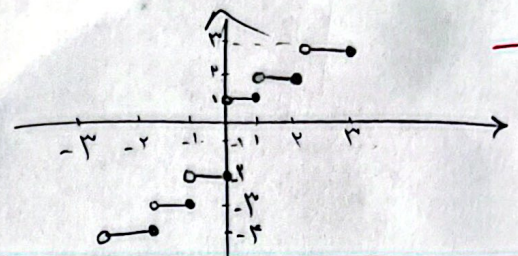
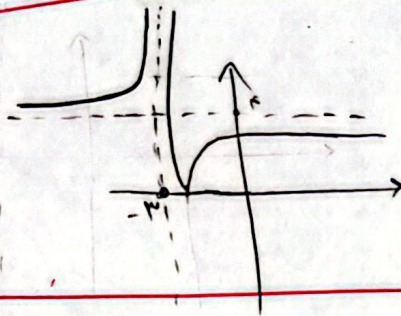


الف)  $2 \sin^2(x + \frac{\pi}{4}) - 1 \Rightarrow R_f = [-1, 1]$  ب)  $[-3, 2] - 4 = [-7, -2] = R_f$  -۱



۱)  $x > 2, x \geq 1 \Rightarrow (x-2) + (x-1) = 3$   
 $x + x = 6$   
 $x = 3$   
 ۲)  $x > 2, x < 1 \Rightarrow (x-2) - (x-1) = 3$   
 $x - x = 4$   
 $x = 4$   
 ۳)  $x < 2, x \geq 1 \Rightarrow -(x-2) + (x-1) = 3$   
 $-x + x = 4$   
 $x = 4$   
 ۴)  $x < 2, x < 1 \Rightarrow -(x-2) - (x-1) = 3$   
 $-x - x = 0$   
 $x = 0$

الف)  $x + \frac{1}{x} = t \Rightarrow \sqrt{x + \frac{1}{x}} \sqrt{x + \frac{1}{x}} + 2 \sqrt{t} = \sqrt{x + \frac{1}{x}} = 0$   
 $\sqrt{t}(\sqrt{t} + 1) = 0$   
 $t + 1 = 0 \Rightarrow t = -1 \Rightarrow x + \frac{1}{x} = -1 \Rightarrow x \neq 0$  -۵

ب)  $3 + 3 \sin x - \sin x - \sin x \rightarrow -\sin^2 x + 2 \sin x + 3$   
 $\max \rightarrow -1 + 2 + 3 = 4$   
 $\min \rightarrow -1 - 2 + 3 = 0 \Rightarrow R_f = [0, 4]$   
 $\frac{b}{2a} \rightarrow \frac{-2}{-2} = 1$

$2x(a^2 + b^2 + c^2) = 1$   
 $3x(4a + 2b + c) = 0$   
 $4a - c = 1 \Rightarrow 4a - 1 = c$   
 $4a + 3b + 4a = 1$   
 $8a + 3b = 1 \Rightarrow 8a + b = 1$   
 $b = 1 - 8a$

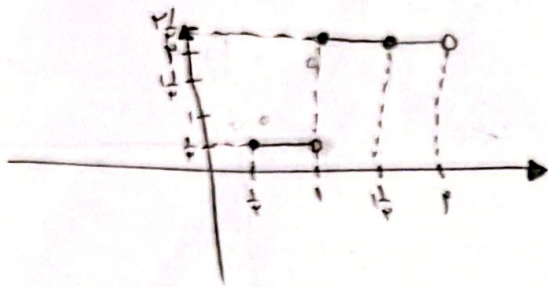
$\sqrt{(1-8a)^2 + 0} - 1 = 0$   
 $\Delta < 0$   
 $R_f = \emptyset$

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

$(1, \frac{-29}{3}), (2, \frac{-29}{3}), (3, -9), (4, \frac{-29}{3}), (5, \frac{-29}{3}), (6, -1)$   
 $(-7, \frac{-29}{3}), (1, \frac{-29}{3}), (9, -7) \Rightarrow \frac{-29 + \dots + -21}{3} = -6$

$x^2 + ax + b - 1 \Rightarrow (x-2)^2$   
 $a = -4, b = 12$   
 $\rightarrow [-4, 12]$   
 $f(-4) = 1, f(12) = 0$   
 $R_f = [-1, 10]$

$\frac{x^3 - 4x}{x+2} = 1$   
 $x^3 - 4x = 1x + 2$   
 $x^3 - 5x - 2 = 0$   
 $(x-2)(x+2)^2 = 0$   
 $x = 2, -2$   
 $a = -2, b = 4, c = -1$   
 $R_f = [-1, +\infty)$



$$f(x) + \frac{1}{2} = g(x)$$

10- هیچ یار خطی ندارد.  $\Rightarrow$