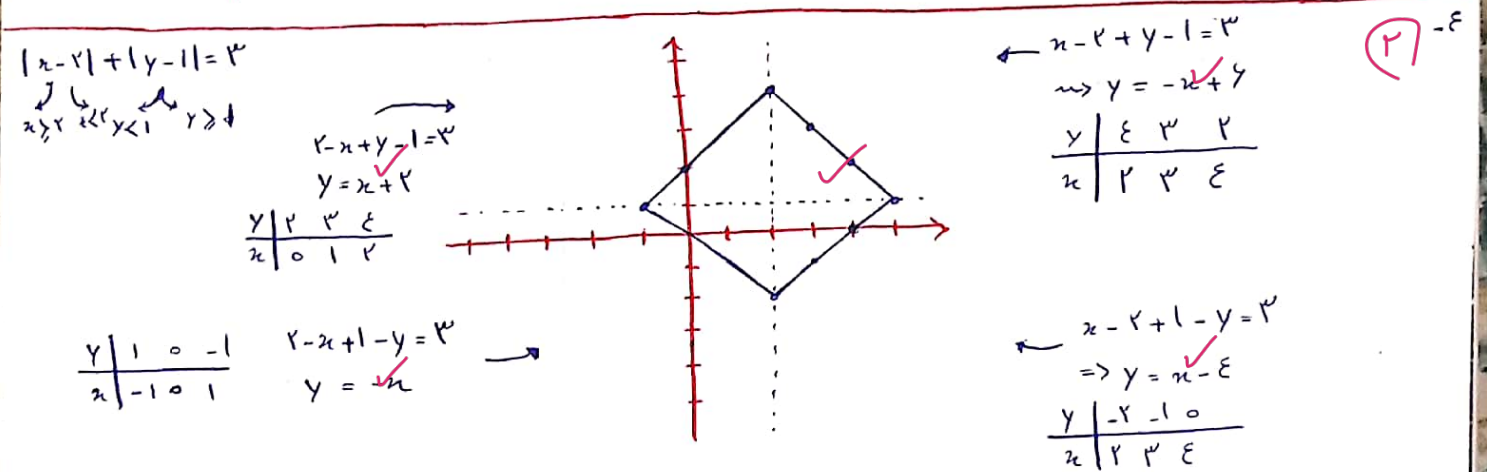
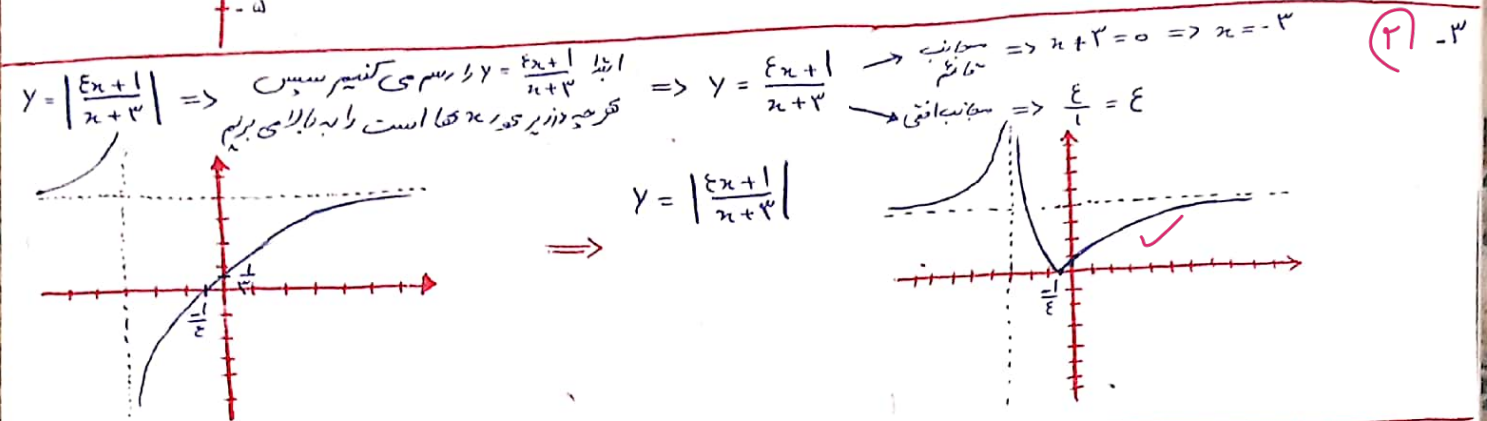
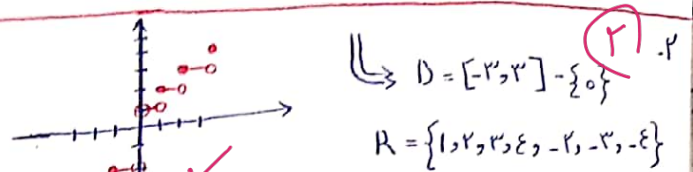
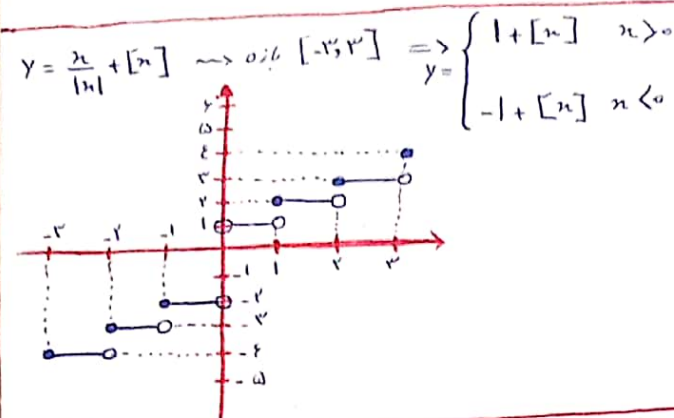


الف)  $f(x) = 2 \sin^2(x + \frac{\pi}{4}) - 1 \Rightarrow 0 \leq \sin^2(x) \leq 1 \Rightarrow 0 \leq \sin^2(x + \frac{\pi}{4}) \leq 1 \Rightarrow 0 \leq 2 \sin^2(x + \frac{\pi}{4}) \leq 2$   
 $\Rightarrow -1 \leq 2 \sin^2(x + \frac{\pi}{4}) - 1 \leq 1 \Rightarrow R = [-1, 1]$

ب)  $g(x) = 3 \cos^3 x - 8 \Rightarrow -1 \leq \cos^3 x \leq 1 \Rightarrow -3 \leq 3 \cos^3 x \leq 3 \Rightarrow -7 \leq 3 \cos^3 x - 8 \leq -5 \Rightarrow R = [-7, -5]$



الف)  $f(x) = x + \frac{1}{x} + \sqrt{x + \frac{1}{x}} \Rightarrow x + \frac{1}{x} > 0 \Rightarrow x > 0 \Rightarrow [2, +\infty) + [2\sqrt{2}, +\infty) = [2 + 2\sqrt{2}, +\infty)$

ب)  $y = (3 - \sin x)(1 + \sin x) \Rightarrow -\sin^2 x + 3 \sin x + 3$   
 $\Rightarrow R = [0, 6]$

الاس دوازدهم بزرگ تالیف شماره 9

تمام دسام خانوادگی به کار و سال ایرانی

تمام شد

$$f(x) = \frac{1}{x}x + 10$$

$$\text{جمع برده} = \frac{1}{x}x_1 + 10 + \frac{1}{x}x_2 + 10 + \dots + \frac{1}{x}x_n + 10 \Rightarrow 10n - \frac{1}{x}(x_1 + x_2 + \dots + x_n)$$

$$D = \{1, 2, 3, \dots, 9\}$$

$$\Rightarrow \text{جمع برده} = 10n - \frac{1}{x}(x_1 + x_2 + \dots + x_n) = 10 \times 9 - \frac{1}{x}(45) = 90 - 15 = 75$$

$$\frac{(1+9) \times 9}{2} = 45 = \text{مجموع}$$

(2)

$$f(x) = \sqrt{ax^2 + bx + c}$$

$$D = [r, +\infty) \quad b > 0$$

$$ax^2 + bx + c \geq 0 \Rightarrow \text{خطی} \Rightarrow a = 0 \Rightarrow bx + c \geq 0 \Rightarrow f(r) = 0 \Rightarrow r^2b + c = 0$$

$$\hookrightarrow f(3) = 1 \Rightarrow 9b + c = 1$$

$$g(x) = \sqrt{x^2 + 4} \Rightarrow R = \sqrt{[8, +\infty)} = [r, +\infty)$$

$$R = [8, +\infty)$$

(2) - V

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

$$x(x-1) \Rightarrow x(x-1) = 1 \Rightarrow x \neq 2 \Rightarrow D = \mathbb{R} - \{2, -1\}$$

$$x^2 - 2x \rightarrow x_2 = \frac{-b}{a} = \frac{2}{1} = 2$$

$$\hookrightarrow y_2 = -2 + 1 = -1$$

$$\hookrightarrow R = [-1, +\infty) - \{1\}$$

$$f\left(\frac{a+b}{rc}\right) = f\left(\frac{2+(-1)}{1(-1)}\right) = f\left(\frac{1}{-1}\right) = f(-1)$$

$$\hookrightarrow f(1) = \frac{(-1)^2 - 1(-1)}{-1+1} = \frac{-1+1}{0} = \text{undefined}$$

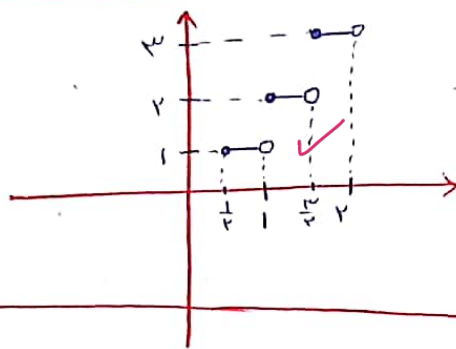
(2) - A

$$y = \sqrt[3]{x^3 + ax^2 + bx - 1} \leftarrow \text{خطی} \Rightarrow y = \sqrt[3]{(x-1)^3} \Rightarrow y = \sqrt[3]{x^3 - 3x^2 + 3x - 1} \Rightarrow a = 3, b = 12$$

$$\Rightarrow y = x-1 \Rightarrow D = [-4, 12] \Rightarrow R = [-1, 10]$$

(2) - 9

$$y = [x] + \left[x + \frac{1}{x}\right] \Rightarrow \begin{cases} \frac{1}{x} \leq x < 1 \Rightarrow y = 1 \\ 1 \leq x < \frac{1}{x} \Rightarrow y = 2 \\ \frac{1}{x} \leq x < 2 \Rightarrow y = 3 \end{cases}$$



log 0, 1, 2, 3 (2) - 10