

خوارزمی / تالیف ۹ / دوازدهم دفتر B

الف) $f(x) = 2 \sin^2(x + \frac{\pi}{4}) - 1$ $\xrightarrow{\sin^2(\frac{\pi}{4}) = 1}$ $y \geq 1$
 $\xrightarrow{\sin^2(\frac{3\pi}{4}) = 0}$ $y \leq -1 \rightarrow [-1, 1]$ 2
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 است

ب) $g(x) = 3 \cos^2 x - 1$ $\xrightarrow{\cos^2 x = 1}$ $y \geq 1$ $\xrightarrow{\cos^2 x = 0}$ $y \leq -1 \rightarrow [-1, 1]$ 2
 $\xrightarrow{\cos^2 x = 1}$ $y \geq 1$ $\xrightarrow{\cos^2 x = 0}$ $y \leq -1 \rightarrow [-1, 1]$ 2
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$y = \frac{x}{|x|} + [x]$

(A) $-1 \leq x < -\frac{1}{2} \rightarrow [x] = -1 \rightarrow -1 - 1 = -2$

(B) $-\frac{1}{2} \leq x < 0 \rightarrow [x] = -1 \rightarrow \frac{x}{|x|} = -1 \rightarrow -1 - 1 = -2$

(C) $0 \leq x < 1 \rightarrow [x] = 0 \rightarrow \frac{x}{|x|} = 1 \rightarrow 1 - 0 = 1$

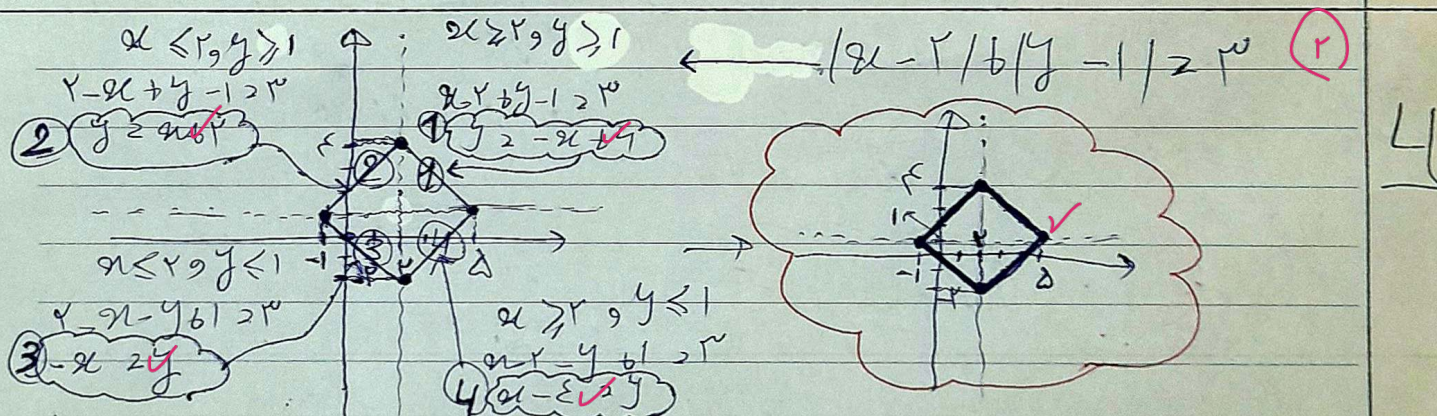
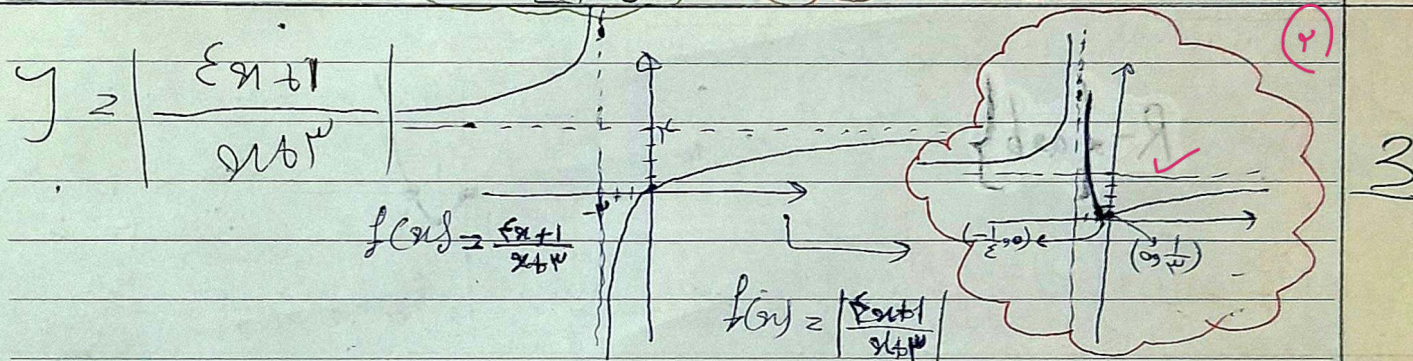
(D) $1 \leq x < 2 \rightarrow [x] = 1 \rightarrow \frac{x}{|x|} = 1 \rightarrow 1 - 1 = 0$

(E) $2 \leq x < 3 \rightarrow [x] = 2 \rightarrow \frac{x}{|x|} = 1 \rightarrow 1 - 2 = -1$

(F) $3 \leq x < 4 \rightarrow [x] = 3 \rightarrow \frac{x}{|x|} = 1 \rightarrow 1 - 3 = -2$

(G) $x \geq 4 \rightarrow [x] \geq 4 \rightarrow \frac{x}{|x|} = 1 \rightarrow 1 - [x] \leq -3$

A scatter plot on the left shows the function's values for integer intervals of x. The y-axis ranges from -3 to 2. The plot shows points at y = -2 for x in [-1, 0), y = 1 for x in [0, 1), y = 0 for x in [1, 2), y = -1 for x in [2, 3), y = -2 for x in [3, 4), and y = -3 for x in [4, 5).



[illegible]

$$\frac{1}{152} \rightarrow -\frac{1}{x}(1) + b + -\frac{1}{x}(x) + b + \dots + -\frac{1}{x} + b$$

$$-\frac{(1+x+b+\dots+bx)}{x^2} + b \times 9$$

$$9x \times b \rightarrow 9x - 18 = 18$$

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

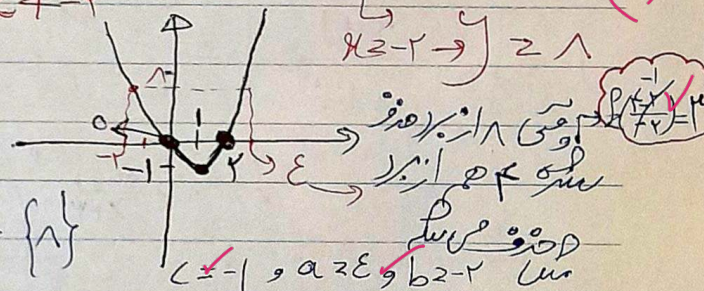
$$[x, +\infty) \rightarrow f(x) \text{ increasing} \rightarrow a > 0 \rightarrow f(x) = \sqrt{bx + c}$$

$$\begin{cases} f(x) = 0 \rightarrow x + c = 0 \\ f(x) = 1 \rightarrow x + c = 1 \end{cases} \rightarrow \begin{cases} x = -c \\ x = 1 - c \end{cases}$$

$$y = \frac{x^2 - 5x}{x + 2} \rightarrow y = \frac{x(x-5)}{x+2} \rightarrow y = x(x-2)$$

$$Df = R - \{a, b\} \rightarrow R - \{x-2\}$$

$$Rf = [c, +\infty) - \{1\} \rightarrow [-1, +\infty) - \{1\}$$



$$y = \sqrt{ax^2 + bx + c}$$

$$y = \sqrt{(ax+b)^2}$$

$$a^2x^2 + 2abx + b^2$$

$$Df = [-4, 12]$$

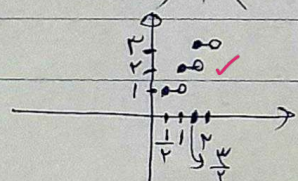
$$x-2 \rightarrow Rf = [-1, 6]$$

$$\begin{cases} a = -4 \\ b = 12 \end{cases}$$

$$x \in \left(\frac{1}{x}, 2\right) \rightarrow y = \left[x\right] + \left[x + \frac{1}{x}\right]$$

$$x + \frac{1}{x} \in [1, 2) \rightarrow 1 \leq x + \frac{1}{x} < 2 \rightarrow \frac{1}{x} \leq x < 1 \rightarrow y = 1 + 0 = 1$$

$$x + \frac{1}{x} \in [2, 3) \rightarrow 2 \leq x + \frac{1}{x} < 3 \rightarrow 1 \leq x < \frac{2}{x} \rightarrow y = 1 + 1 = 2$$



Elegance