

Subject :

Year. Month. Date. ()

۲۰ نفری

دریافته در سطح

الف) $f(x) = 2 \sin^2(x + \frac{\pi}{2}) - 1$

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

ب) $g(x) = 2 \cos^2 x - 2$

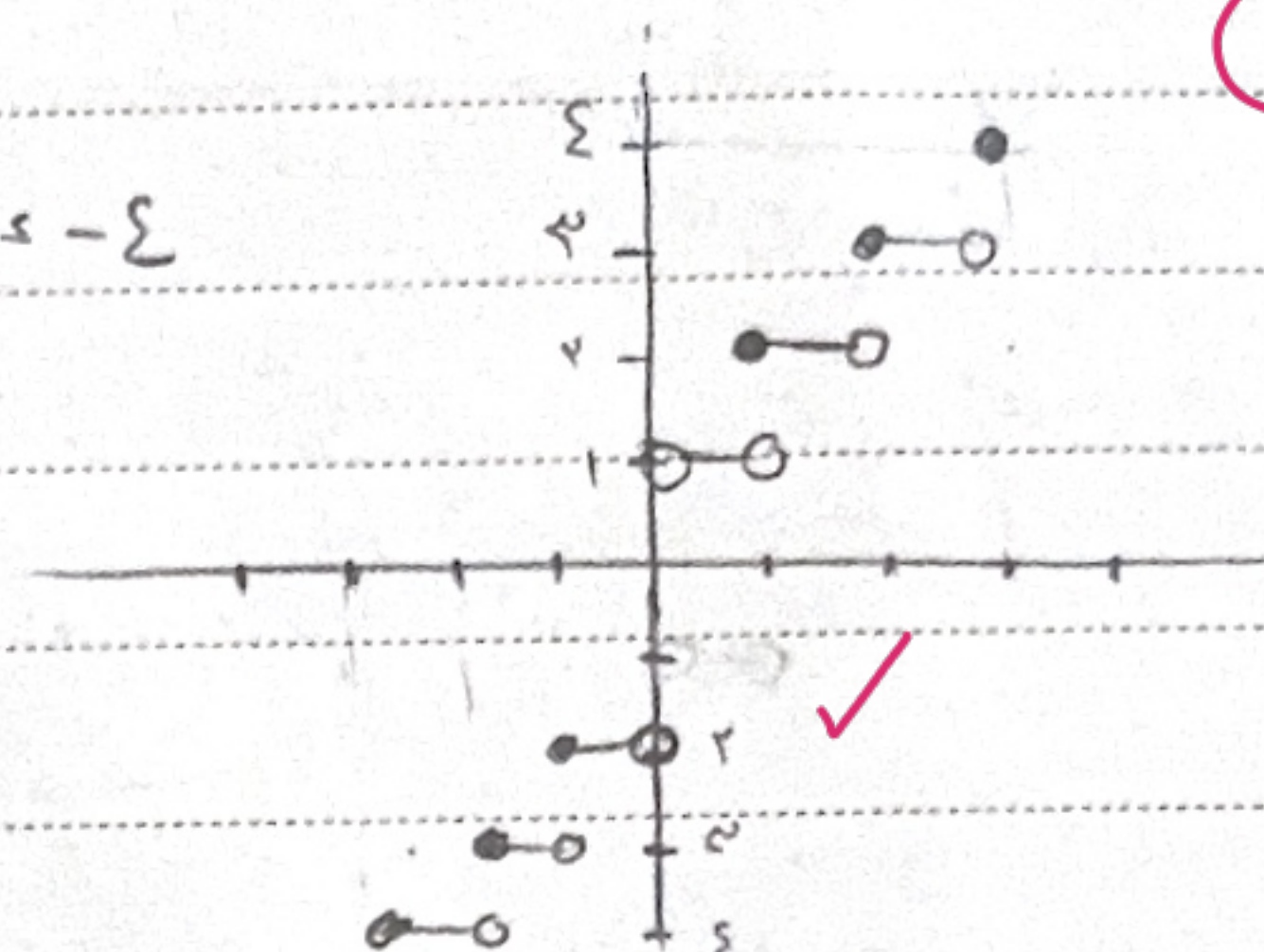
$\rightarrow -1 \leq \cos^2 x \leq 1 \rightarrow -2 \leq 2 \cos^2 x \leq 2 \rightarrow -2 \leq 2 \cos^2 x - 2 \leq 0 \rightarrow R_g = [-2, 0]$

$y = \frac{x}{|x|} + [x]$
 $x \neq 0$

$-2 \leq x < 2 \rightarrow -1 - 2 \leq -2$

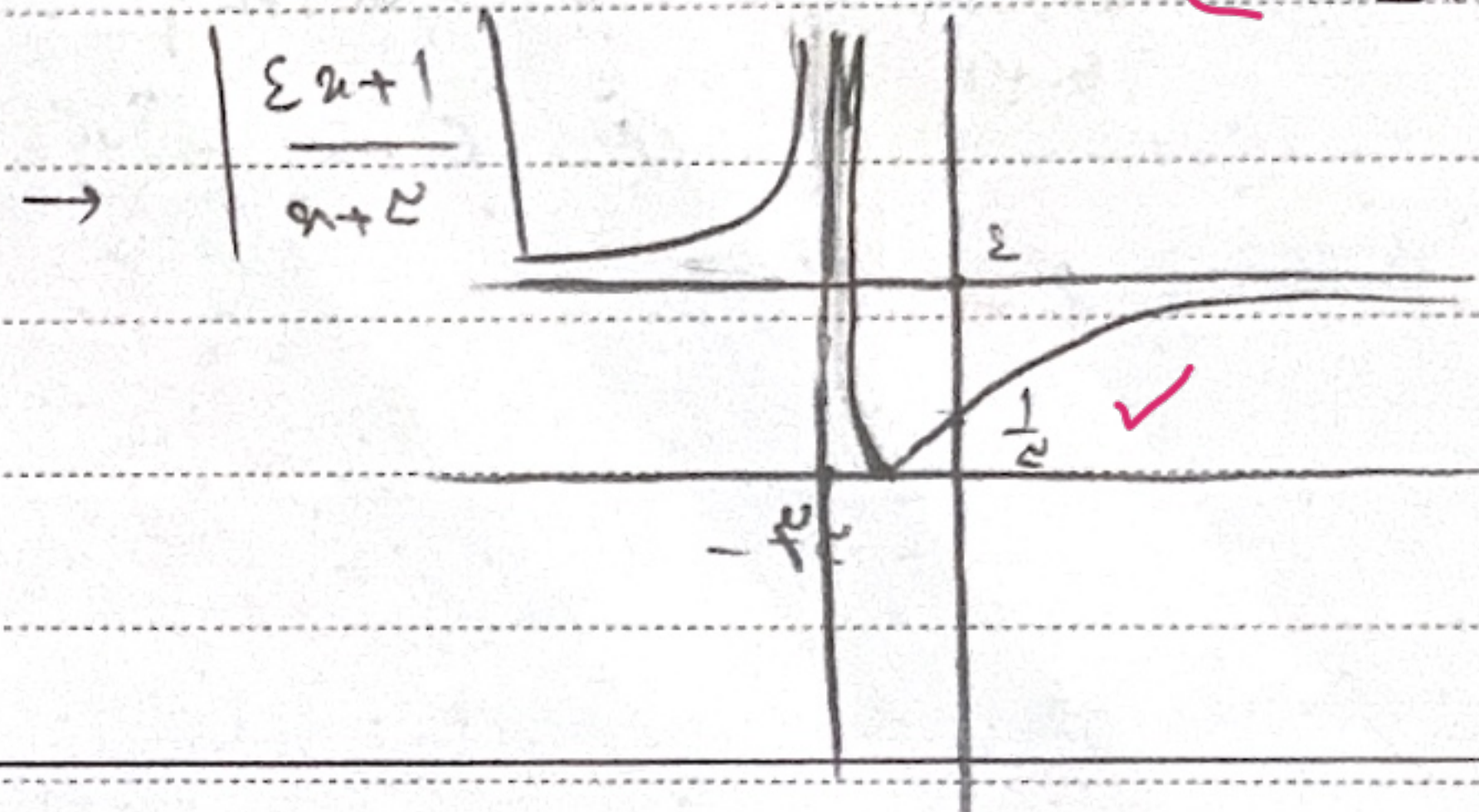
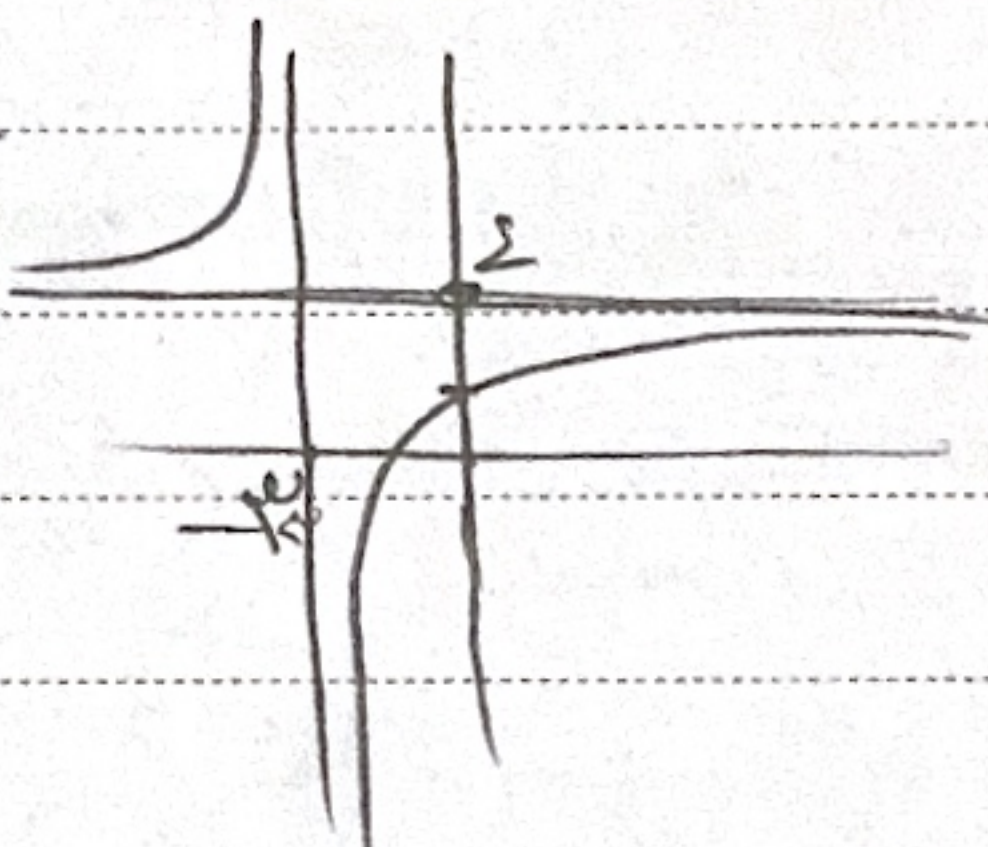
$0 \leq x < 1 \rightarrow 1$

$1 \leq x < 2 \rightarrow 2$

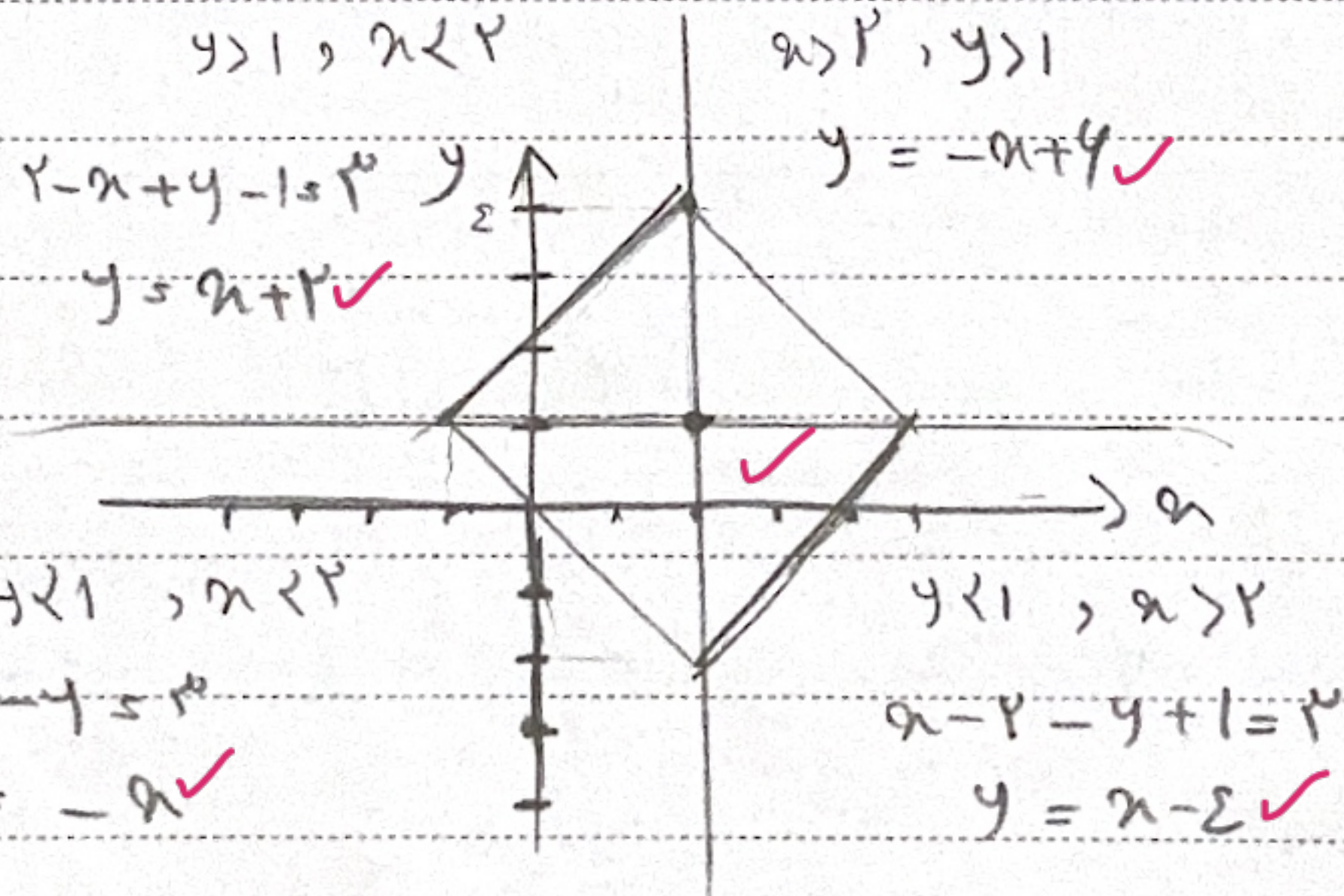


$y = \left| \frac{x+1}{x+2} \right|$

$\frac{x+1}{x+2}$
 $\frac{1}{x+2}$
 $\frac{1}{x+2} \rightarrow \frac{1}{x}$



$|x-2| + |y-1| = 2$
 $y-1 = -1$



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

$x + \frac{1}{x} \geq 2 \rightarrow [2 + \infty)$

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

ب) $y = (1 - \sin x)(1 + \sin x) = 1 - \sin^2 x = \cos^2 x$

$\rightarrow \sin x = 1 \rightarrow -1 + 2 + 2 \leq 2$
 $\rightarrow \sin x = -1 \rightarrow -1 - 2 + 2 \leq -1$
 $\rightarrow \sin x = \frac{1}{2} \rightarrow \frac{1}{4} \leq \frac{1}{4}$

$R_f = [0, 1]$

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$$f(x) = -\frac{1}{x}x + 1 \quad D_f = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

(r) - 4

اگر $f(x) = -\frac{1}{x}x + 1$ باشد
 $\rightarrow \left(\frac{f(x) + f(x)}{2} \right) \times 4 = \left(\frac{\frac{1}{2} + \frac{1}{2}}{2} \right) \times 4 = \frac{1}{2} \times 4 = 2$

$$a_1 = -\frac{1}{x} \times 1 + 1 = \frac{1}{2} \quad a_9 = -\frac{1}{x} \times 9 + 1 = 0 = \frac{1}{2}$$

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

(r) - 1

$$D_f = [x + \infty) \rightarrow a > 0 \rightarrow \sqrt{bx + c} = bx + c \rightarrow x > -\frac{c}{b} \rightarrow -\frac{c}{b} \cdot 2 \rightarrow c = -2b$$

فرض کنیم $a=1$

$$f(x) = \sqrt{bx + c} = 1 \rightarrow |bx + c| = 1 \rightarrow bx + c = 1 \rightarrow b = 1 \rightarrow c = -2$$

$$g(x) = \sqrt{bx^2 + ax - 2c} = \sqrt{x^2 + 2} \rightarrow \sqrt{[2 + \infty)} = [x + \infty)$$

$$R_g = [x + \infty)$$

$$f(x) = \frac{x^2 - 2x}{x + 2}$$

$$D_f = \{a, b\}$$

$$D_f = [c + \infty) = \{1\}$$

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

(r) - 1

$$x \neq -2 \text{ و } 2$$

$$x^2 - 2x \neq 1 \rightarrow x^2 - 2x - 1 \neq 0$$

$$(x - 2)(x + 2) \neq 0 \rightarrow x \neq 2, -2$$

$$x^2 - 2x \rightarrow \lim_{x \rightarrow -1} \frac{x^2 - 2x}{x + 2} = \frac{1 - 2}{-1} = 1 \rightarrow [-1 + \infty) = \{1\}$$

$$a, b = -2, 2$$

$$c = -1$$

$$f\left(\frac{a+b}{2c}\right) = f\left(\frac{2}{-2}\right) = f(-1) = 1 + 2 = 3$$

$$y = \sqrt{x^2 + ax + b} - 1$$

$$(x - 2)^2 = x^2 + 12x - 4x^2 - 1$$

$$a = -4, b = 12$$

$$[a, b] = [-4, 12]$$

$$y = \sqrt{(x - 2)^2} - 1 = |x - 2| - 1 \rightarrow -1 \leq x - 2 \leq 1 \rightarrow -1 \leq x - 2 \leq 1$$

$$R_f = [-1, 1]$$

$$y = [x] + \left[x + \frac{1}{x}\right]$$

(r) - 10

$$\frac{1}{x} \leq x < 1 = 1$$

$$1 \leq x < 1/2 = 2$$

$$1/2 \leq x < 1/3 = 3$$

$$\frac{1}{x} \leq x < 1/4 = 4$$

