

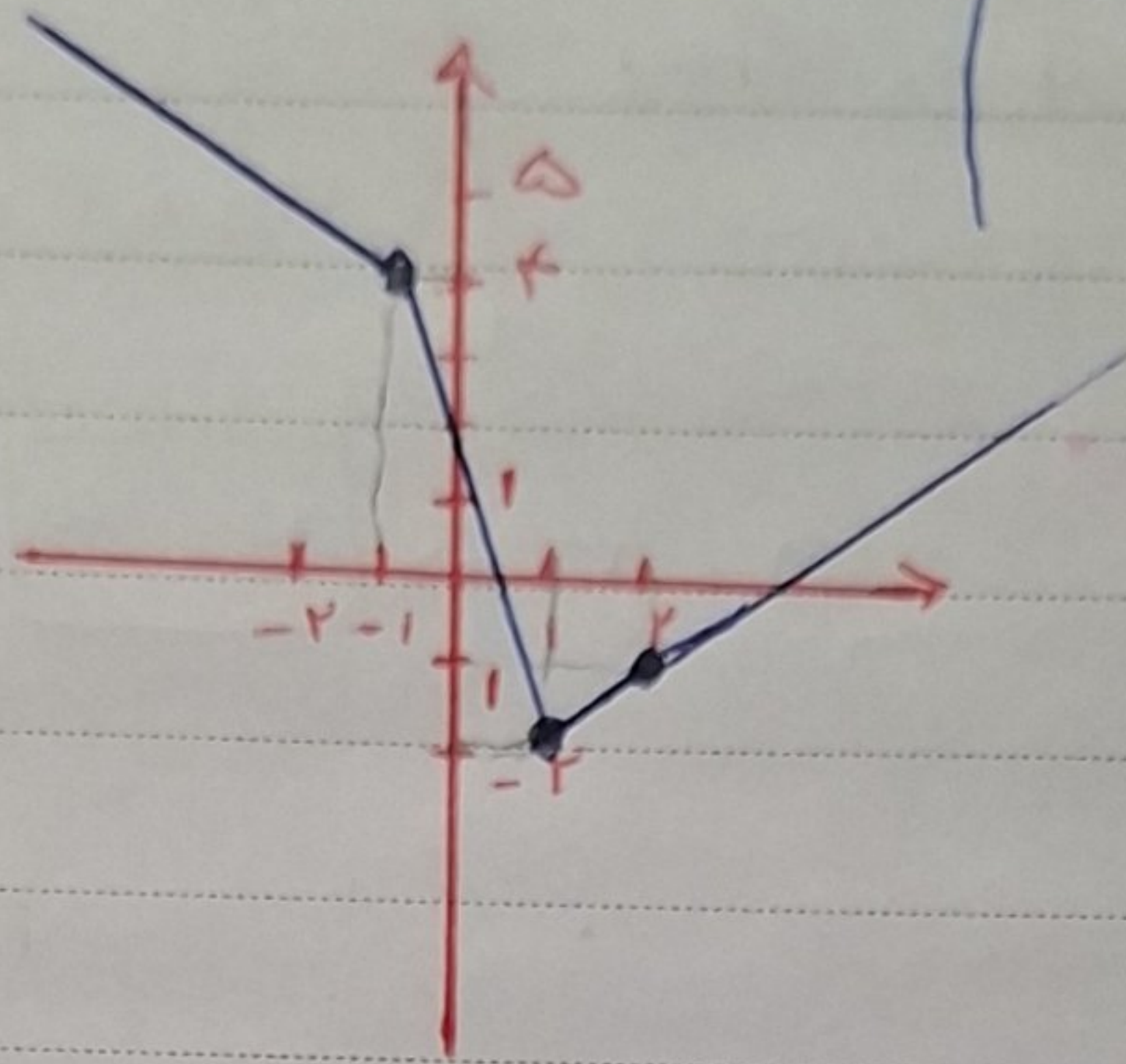
Subject.

Date.

(10) ب)  $y = |2x-2| - |x+1| \Rightarrow y = \begin{cases} 2x-2-x-1 & x > 1 \\ -2x+2-x-1 & -1 \leq x \leq 1 \\ -2x+2+x+1 & x < -1 \end{cases}$

$\Rightarrow \begin{cases} x-3 & x > 1 \\ -2x+1 & -1 \leq x \leq 1 \\ -x+3 & x < -1 \end{cases}$

$\Rightarrow R_f = [-2, +\infty)$



18, 15

تکلیف ۷ امیرپوی رزان زاربان - پی زهم B

(1) الف)  $y = x + |2x-4|$

$x \geq 2 \Rightarrow y = x + 2x - 4 \Rightarrow y = 3x - 4, x \geq 2 \Rightarrow y \geq 2 \Rightarrow y \in [2, +\infty)$  شرط ۱

$x < 2 \Rightarrow y = x - 2x + 4 \Rightarrow y = -x + 4, x < 2 \Rightarrow y < 2 \Rightarrow y \in (-2, +\infty)$  شرط ۲

$R_f = 1 \cup 2 \Rightarrow R_f = [2, +\infty)$  ✓

(2)

ب)  $|x-2| + |x-1| - |x|$

$x \geq 2 \Rightarrow y = x-2+x-1-x = x-3, x \geq 2 \Rightarrow y \geq -1 \Rightarrow y \in [-1, +\infty)$  شرط ۱

$1 \leq x < 2 \Rightarrow y = 2-x+x-1-x = 1-2x, 1 \leq x < 2 \Rightarrow y \in [-1, 0]$  شرط ۲

$0 \leq x < 1 \Rightarrow y = 2-x+1-x-x = 3-3x, 0 \leq x < 1 \Rightarrow y \in [0, 3]$  شرط ۳

$x \leq 0 \Rightarrow y = 2-x+1-x-x = 3-3x, x \leq 0 \Rightarrow y \in [3, +\infty)$  شرط ۴

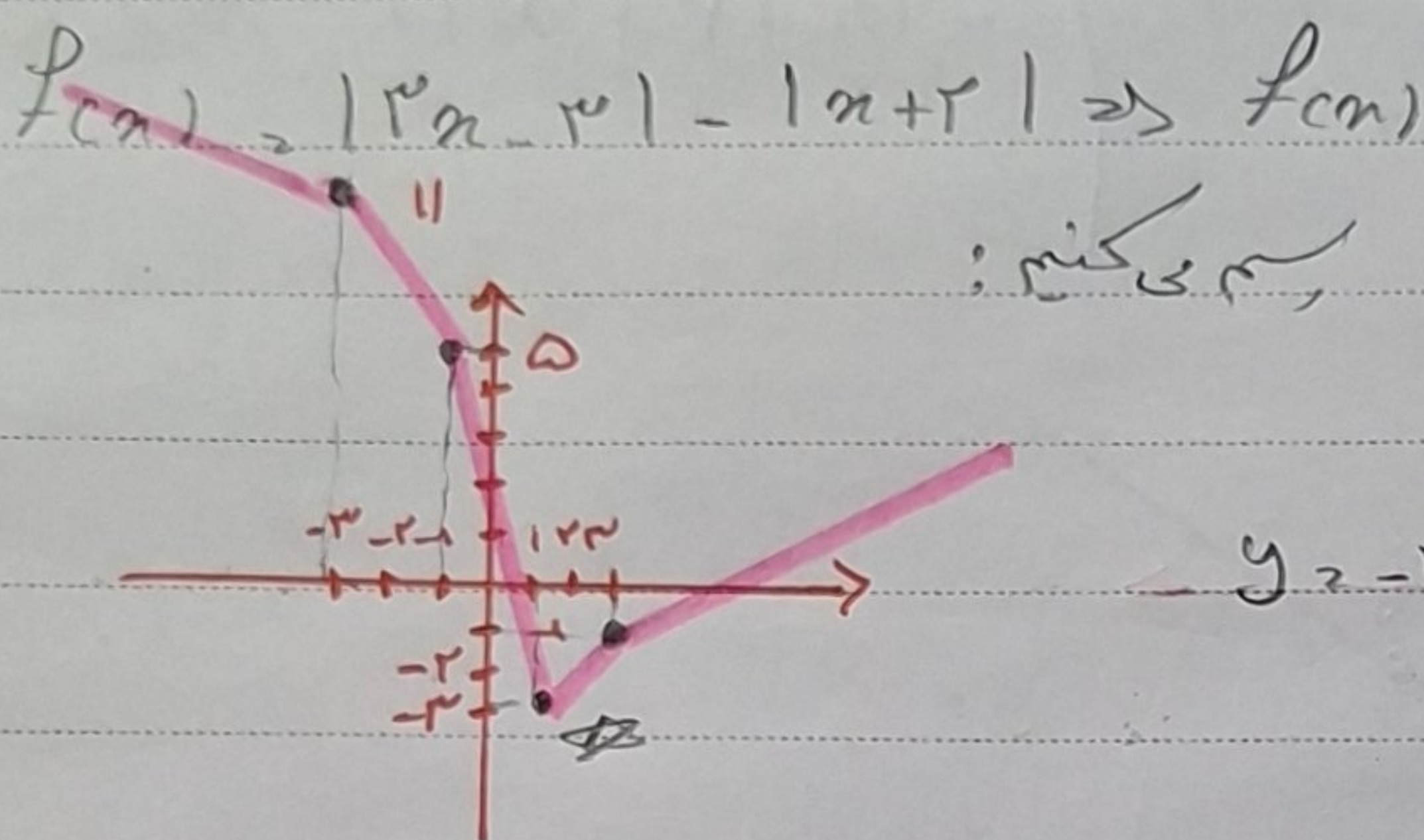
$R_f = 1 \cup 2 \cup 3 \cup 4 \Rightarrow R_f = [-1, +\infty)$  ✓

$R_f = 1 \cup 2 \cup 3 \cup 4 \Rightarrow R_f = [-1, +\infty)$  ✓

P4PCO



$$\left\{ \begin{array}{l} -r_m - r - n - r_2 - r_m \Delta \quad n > 1 \\ -r_m + r - n - r_2 - r_{m+1} - r \leq n \leq 1 \\ -r_m + r + n + r_2 - r_{m+1} \Delta \quad n \leq -1 \end{array} \right.$$



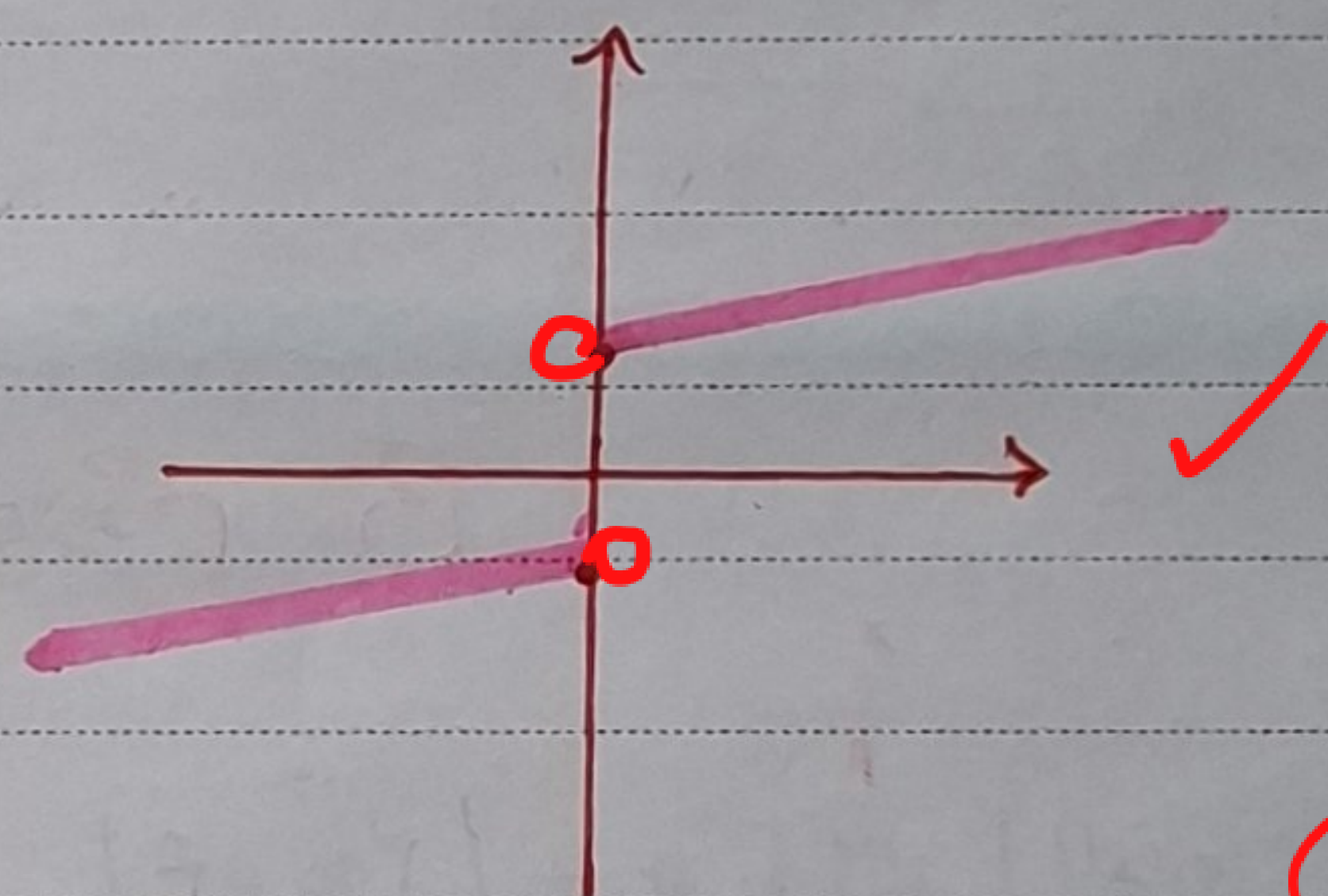
$$y_2 - r \Rightarrow \boxed{k_2 - r} \quad \checkmark$$

3) الف

$$y = x + \frac{x}{|x|}$$

$$n > 0 \quad \frac{n}{|n|} = 1 \Rightarrow y = n+1$$

$$\xrightarrow{n \leq 0} \frac{n}{|n|} = -1 \Rightarrow y = n-1$$



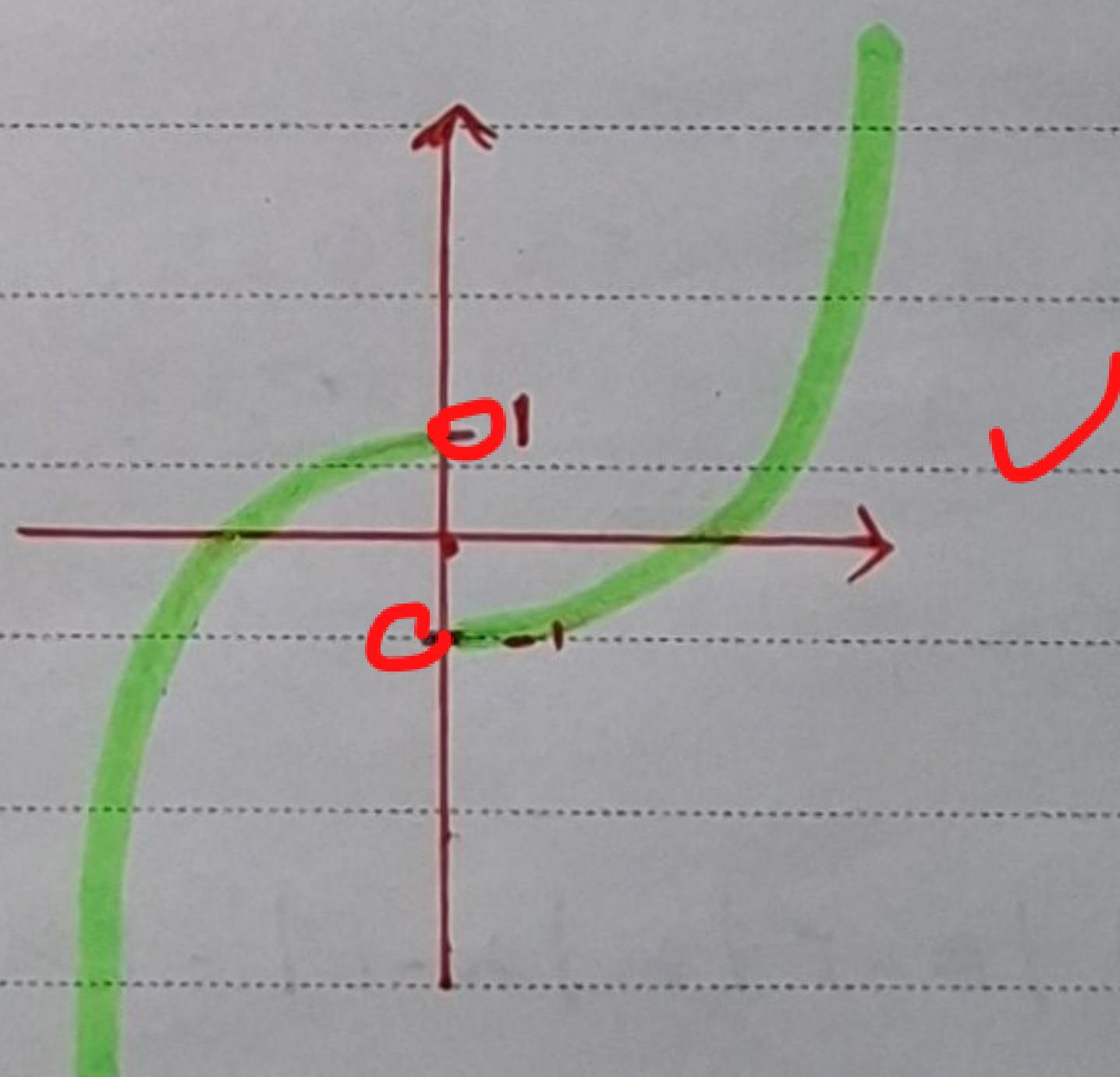
ب

صفحه‌ها تعریف شده‌اند

$$y_2 = n|n| - \frac{n}{|n|}$$

$$x > 0 \rightarrow y = x^r - 1$$

$$n \leq y_2 - n^r + 1$$

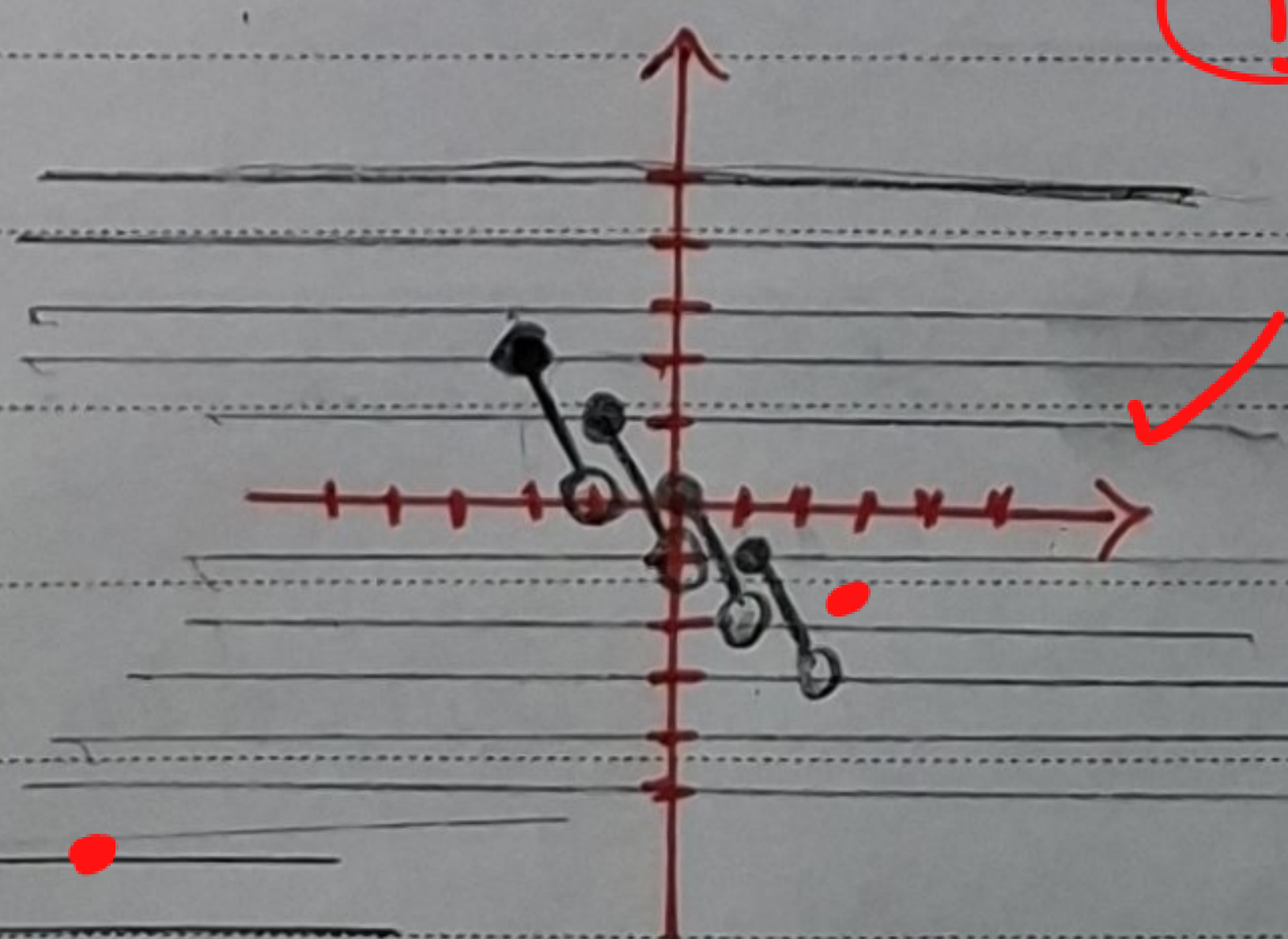


(4) الف)

$$y_2[n] = \gamma_n$$

$$n \in [-r, -1) \Rightarrow -r - 1 \leq n \Rightarrow n \in [-1, 0) \Rightarrow -1 - 1 \leq n$$

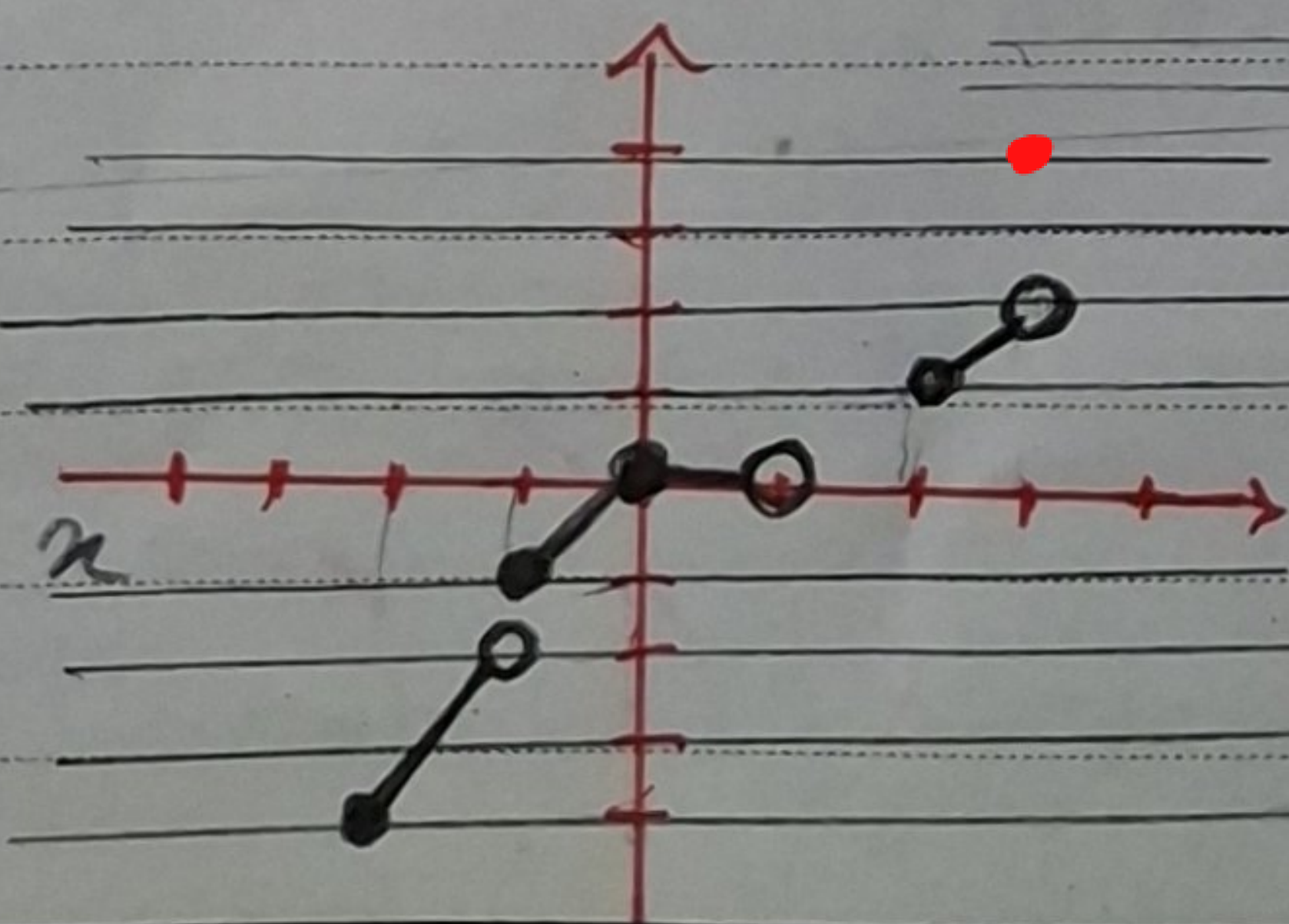
$$n \in [0, 1) \Rightarrow -r_n \Rightarrow n \in [1, r) \Rightarrow 1 - r_n$$



ب)  $y_2[x] + |x|$

$$x \in [-r, -1) \Rightarrow (-r)(-x) \geq x$$

$$n \in [0, 1) \text{ и } n \in [1, r) \text{ и } n$$



وقبله خد ۲  
را جمع باین مشتخص  
نمی



5 الف)  $y = 3x - [3x] \Rightarrow y = t - [t] \Rightarrow R_f = [0, 1)$  ✓ (1, 1.5)

ب)  $y = tx - t[x] \Rightarrow y = t(x - [x]) \Rightarrow R_f = [0, t)$  ✓

ج)  $y = x - \Delta \left[ \frac{x}{\Delta} \right] \Rightarrow y = \Delta t - \Delta [t] \Rightarrow y = \Delta(t - [t]) \Rightarrow R_f = [0, \Delta)$  ✓

د)  $y = [2x] - 2x \Rightarrow y = [t] - t \Rightarrow R_f = [-1, 0]$  ✓  
دقة!

6 الف)  $y = 3 \sin(x) + 2 \cos(x)$

$\Rightarrow \sqrt{-9+4} < 3 \sin x + 2 \cos x \leq \sqrt{9+4} \Rightarrow R_f = [-\sqrt{13}, \sqrt{13}]$  ✓ (1, 1.5)

ب)  $y = t \sin(x) - 3 \cos(x)$

$\Rightarrow -\sqrt{16+9} \leq t \sin x - 3 \cos x \leq \sqrt{16+9} \Rightarrow R_f = [-5, 5]$  ✓

ج)  $y = [2 \sin(x) + 5 \cos(x)]$

$-\sqrt{29} \leq 2 \sin x + 5 \cos x \leq \sqrt{29} \Rightarrow R_f = [2 \sin x + 5 \cos x]$

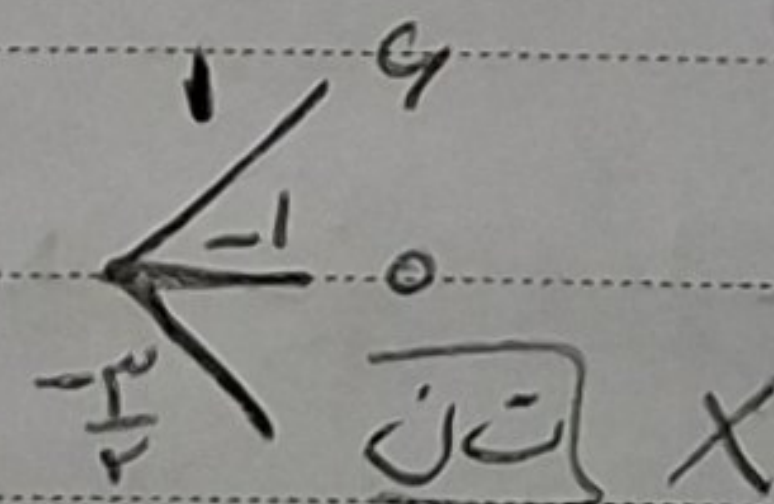
$= \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$  ✓

د)  $y = \sqrt{\cos x - 2 \sin x} \Rightarrow -\sqrt{5} \leq \cos x - 2 \sin x \leq \sqrt{5}$

$\Rightarrow 0 \leq \sqrt{\cos x - 2 \sin x} \leq \sqrt{5} \Rightarrow R_f = [0, \sqrt{5}]$  ✓  
دوبارہ رادیکال  
دائیم

7 الف)  $y = \sin^2 x + 3 \sin x + 2$

$\Rightarrow R_f = [2, 6]$  ✓



(2)

ب)  $y = 2 \sin^2 x + 3 \sin x + 2$   $\Rightarrow R_f = [2, 6]$  ✓



الف) ⑧  $y = \sin^2 x + t \cos^2 x \Rightarrow y = \sin^2 x + \cos^2 x + t \cos^2 x$

$\Rightarrow y = 1 + t \cos^2 x$  ,  $0 \leq \cos^2 x \leq 1 \Rightarrow 0 \leq t \cos^2 x \leq t$

$1 \leq 1 + t \cos^2 x \leq 1 + t \Rightarrow R_f = [1, 1+t]$  ✓

(۲)

ب)  $y = \frac{t \cot x}{1 + \cot^2 x} \Rightarrow y = t \times \frac{\cos x}{\sin x} \times \sin^2 x = t \sin x \times \cos x$   
 $= \frac{1}{2} t \sin 2x \Rightarrow y = \sin 2x \Rightarrow R_f = [-1, 1]$  ✓

⑨  $y = \sin^4 x + \cos^4 x \Rightarrow \frac{1}{2} \leq \sin^4 x + \cos^4 x \leq 1$   
 $\Rightarrow R_f = [\frac{1}{2}, 1]$  ✓

(۲)

ب)  $y = [\sin^2 x + \cos^2 x] \Rightarrow \frac{1}{2} \leq \sin^2 x + \cos^2 x \leq 1$   
 $\Rightarrow [\sin^2 x + \cos^2 x] = 1 \Rightarrow R_f = \{0, 1\}$  ✓

⑩ الف)  $y = \frac{2n^2 + 7n - 4}{n+4} \Rightarrow y = \frac{(n+4)(2n-1)}{n+4} \Rightarrow y = (2n-1), (n \neq -4)$   
 $2(-4) - 1 = -9 \Rightarrow R_f = \mathbb{R} - \{-9\}$  ✓

(۱, ۷۵)

ب)  $y = \frac{n^3 - 1}{n-1} \Rightarrow y = \frac{(n-1)(n^2 + n + 1)}{n-1} \Rightarrow y = n^2 + n + 1$

داده روحی این لحاظ نیست

$\Rightarrow y = (n + \frac{1}{2})^2 + \frac{3}{4} \Rightarrow R_f = [y_{\min}, +\infty) \Rightarrow R_f = [\frac{25}{4}, +\infty)$  ✓

$D = \mathbb{R} - \{1\}$   $f_{n+1} = f_{n-1}, 3$  دانه محسن ۳ حذف  
 نمی شود