

$$\begin{aligned} f(n) - n f(n) &\leq 2(n+1) \xrightarrow{\times n} n f(n) - n^2 f(n) \leq 2n(n+1) \quad (1) \\ f(n) - n f(n) &\leq 2(n+1) \xrightarrow{\times (-1)} -f(n) + n f(n) \leq -2(n+1) \quad (2) \end{aligned}$$

$$f(n) \leq \frac{(n-1)(2n+1)}{(n^2-1)}$$

$$\Rightarrow f(0) \leq 3 \quad \Rightarrow f(n) \leq n^2 - 3n + 3 \quad \Rightarrow f(n) \leq n^2 - 3n + 3$$

$$n^2 - (2y) n + y^2 \leq 0$$

$$\frac{y \pm \sqrt{y^2 - 4y^2 + 4y^2 - 1}}{2}$$

$$y^2 - 4y + 4y^2 - 1$$

$$R_y \in (-\infty, -1] \cup [1, \infty)$$

$$\text{الف) } \frac{-b}{2a} = \frac{0}{2} = 0 \leq x_1 \quad y_1 = -\frac{1}{1} \quad R_y \in [-\frac{1}{1}, \infty)$$

$$\text{ب) } \frac{-b}{2a} = 0 \quad \sqrt{(0-0)^2} \Rightarrow R_y \in [0, 1]$$

$$2.) \sqrt{1-P} \Rightarrow R_y \in \sqrt{1-P} \Rightarrow [0, \infty)$$

$$> |P|$$

$$\text{الف) } |P| \in \{ \frac{1}{2} \}$$

$$\text{ب) } \sqrt{1-P} \Rightarrow [0, \infty) = \{ \frac{1}{2} \}$$

$$2.) \sqrt{1-P} = \frac{1}{\sqrt{1-P}} \Rightarrow \left[\sqrt{1-P} = \frac{1}{\sqrt{1-P}} \Rightarrow \infty \right)$$

$$\sqrt{1-P} = \frac{1}{\sqrt{1-P}}$$

$$> \frac{1}{n^2} \Rightarrow \frac{1}{n^2} \Rightarrow \frac{1}{n^2} \Rightarrow R_y \in \left[\frac{1}{n^2}, \infty \right)$$

رویکر اصلی : $3n^2 - y n^2 \leq y \leq (3-y) n^2 + y + 6 \leq 0$

$\Rightarrow -t(3-y)(y+6) \geq 0$

$\Rightarrow R_y = (-\infty, -6] \cup [3, \infty)$

مهم است چون تابع ضرب می شود و در نهایت خارج صفر

رویکر اصلی $\rightarrow \min n^2 \leq y \leq \frac{6}{-1} = -6$

$\rightarrow \max n^2 \leq \infty \quad \frac{3n^2 + 6}{2-3} \leq 3$

عمره می تواند صفر شود $\rightarrow (-\infty, -6] \cup [3, \infty)$

$\min \sin x = -1 \quad d(m) \leq \frac{1}{-1} = -1$
 $\max \sin x \quad d(m) \leq (-3)$

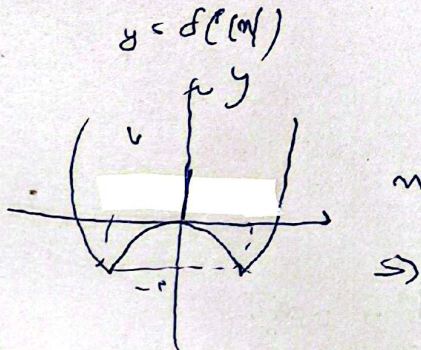
عمره می تواند صفر شود $\Rightarrow R_y \leq [-3, -1]$

الف) $y = \left\lfloor \frac{3n-1}{2n} \right\rfloor \quad R_y = [0, \infty) \cup \left\{ \frac{3}{2} \right\}$

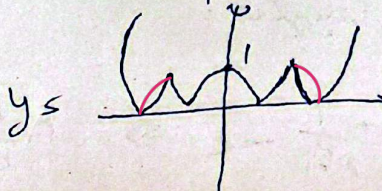
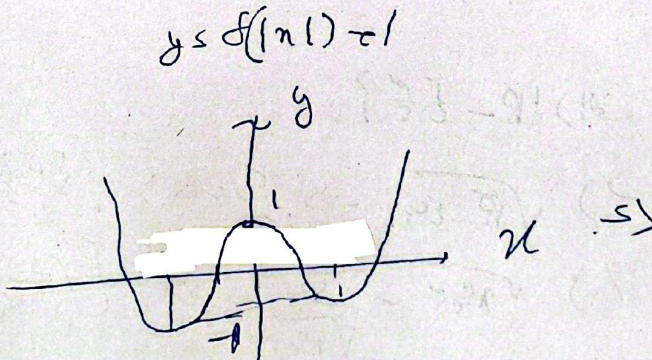
ب) $\sqrt{\frac{9}{4}} = \frac{3}{2} \Rightarrow R_y \leq \left\{ \frac{3}{2} \right\}$

$y = \begin{cases} n^2 - m, & n \geq m \\ -n^2 - m, & n < m \end{cases} \Rightarrow \frac{1}{2} \leq 1 \leq \min \Rightarrow R_y = [0, \infty)$
 $\Rightarrow \frac{1}{2} \geq 1 \Rightarrow R_y = (-\infty, 0]$

$I \cup J \subseteq R \subseteq R_y$



$y \leq |f(m) + 1|$



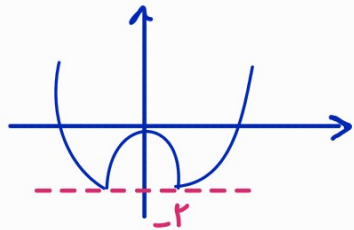
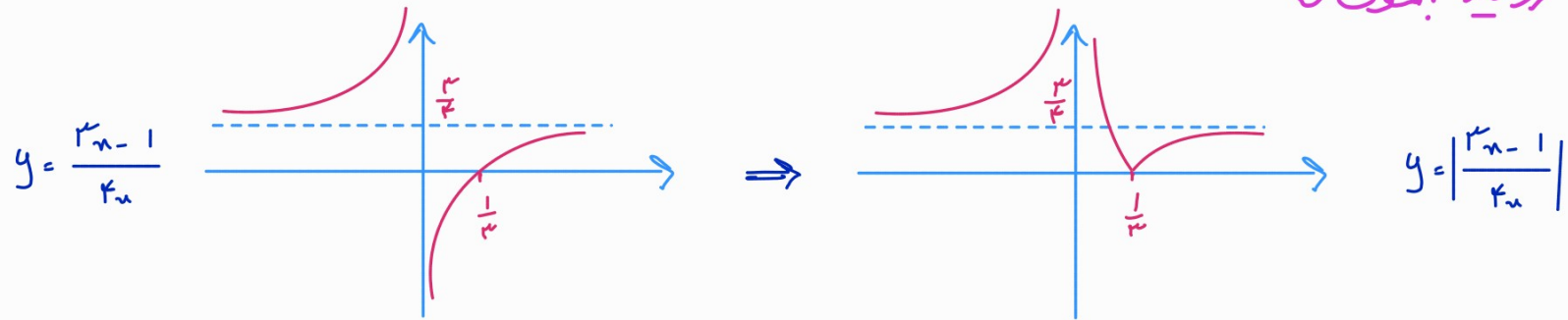
وقت!

۸- اول برد عبارت داخل قدر مطلق
رو حساب می کنیم بعد قدر مطلق می گیریم

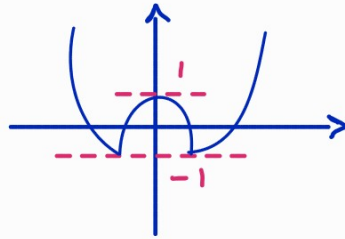
فقط حواسه باشه که $y = \frac{3}{4}$ هم هست داخل برد

$y = -\frac{3}{4}$ عضو برد عبارت داخل قدر مطلق هست و وقتی قدر مطلق بگیریم $y = \frac{3}{4}$

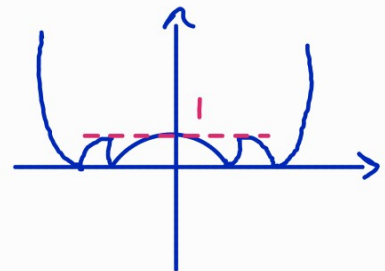
پرونده بهمون نه



$$y = f(|x|)$$



$$y = f(|x|) + 1$$



$$y = |f(|x|) + 1|$$

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