

14, 15

سليم علي

$$\left. \begin{aligned} x \Rightarrow f(-x) - x f(x) &= 2|x| + 1 \\ -x \Rightarrow f(x) + x f(-x) &= 2|x| + 1 \end{aligned} \right\} \Rightarrow f(x) + x f(x) = -f(x) - x f(x)$$

$$f(x)(1+x) = -f(x)(1+x) \Rightarrow f(x) = -f(-x) \Rightarrow \text{سواء سراسل}$$

$$-f(x) - x f(x) = -f(x)(1+x) = 2|x| + 1$$

صفحة اخرى...

$$f(x) = \frac{2|x| + 1}{-x - 1}$$

$$f(0) + f(0) = 9$$

$$f(0) = 12$$

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

$$f(x) = x^2 - 12x + 16 \Rightarrow$$

$$f(x^2) = x^4 - 12x^2 + 16$$

$$y x - y = x^2 + x + 2$$

$$x^2 + (1-y)x + 2+y = 0$$

$$\Delta \geq 0 \Rightarrow$$

$$(1-y)^2 - 4(2+y) \geq 0$$

$$y^2 - 4y - 8y - 1 + 1 \geq 0$$

$$y^2 - 4y - 12 \geq 0$$

$$(y-4)(y+3) \geq 0$$

$$\frac{-1}{+} \quad \frac{4}{+}$$

$$R_f = (-\infty, -1] \cup [4, +\infty)$$

dotnote

$$u_{ex} = \frac{+w}{\varepsilon}$$

$$x \times \frac{2w}{\lambda} - \frac{2w}{\varepsilon} + 1 = \frac{-2w}{\lambda} + 1 = \frac{-1w}{\lambda} \Rightarrow$$

(2) - ε
(الف)

$$R_f = [-\frac{1w}{\lambda}, +\infty)$$

$$\frac{-9}{-1} = w \quad -9 + 11 - w = \varepsilon \quad \sqrt{(-\infty, \varepsilon]} \Rightarrow$$

$$R_f = [0, w]$$

$$u^v \times x^r \Rightarrow R_f = \mathbb{R}$$

$$\sqrt{-\infty, +\infty} \Rightarrow$$

$$R_f = [0, +\infty)$$

$$u^w - 4x^r + vx + \varepsilon \Rightarrow R_f = \mathbb{R}$$

$\mathbb{R}^k$

$$\log(\mathbb{R}) \Rightarrow \mathbb{R} \Rightarrow \boxed{R_f = \mathbb{R}}$$

د.ل.

Alawi

مسئله باروشن بیل زندن. آفرین!

الف

(2)

$$-\frac{-2y-1}{+2y-3} = \frac{2y+1}{2y-3} = x \Rightarrow y \neq \frac{3}{2} \Rightarrow$$

$$R_f = \mathbb{R} - \left\{ \frac{3}{2} \right\}$$

$$x = \sqrt{\frac{+2y+1}{y-3}} \Rightarrow \sqrt{R} = \sqrt{\mathbb{R} - \{3\}} \xrightarrow{\sqrt{\quad}} [0, +\infty) - \{2\}$$

$$\frac{x^2+3}{\sqrt{x^2+3}} + \frac{1}{\sqrt{x^2+3}} = \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}} \Rightarrow$$

(2)

$$x=0 \Rightarrow \sqrt{3} + \frac{1}{\sqrt{3}}$$

$$R_f = \left[\frac{\varepsilon}{\sqrt{3}}, +\infty \right)$$

$$\varepsilon \sqrt{3}$$

$$y = x^2 + \varepsilon + \frac{1}{x^2 + \varepsilon} - \varepsilon$$

مکتوبین $x^2 = 0$

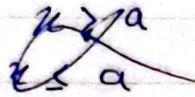
عکسین $x^2 = 0$

1) $\varepsilon + \frac{1}{\varepsilon} - \varepsilon = \frac{1}{\varepsilon}$

$$R_f = \left[\frac{1}{\varepsilon}, +\infty \right)$$

dotnote

Asad



۶- الف) بیل زدن

$$x^2 + \frac{y + \varepsilon}{y - 3} \Rightarrow$$

$$\frac{-\varepsilon}{0 - \frac{1}{3}} + \frac{3}{\frac{1}{3} +} \Rightarrow R_f = (-\infty, -\varepsilon] \cup (3, +\infty)$$

$$R_f = (-\infty, -\varepsilon] \cup (3, +\infty)$$

ب) $\square = x^2 \begin{matrix} \xrightarrow{\max} +\infty \\ \xrightarrow{\min} 0 \end{matrix} \Rightarrow y = \frac{3x^2}{3x} = 3$
 $\Rightarrow y = \frac{0 + \varepsilon}{0 - 1} = -\varepsilon$

$x^2 - 1 \Rightarrow$ صفری شود $\Rightarrow (-\infty, -\varepsilon] \cup (3, +\infty)$

$$\delta_{\min} = -\frac{-3y - \varepsilon}{y - 3} = \frac{3y + \varepsilon}{y - 3} \quad \text{راه خوب} \quad (2)$$

راه خوب $\Rightarrow \delta_{\min} \xrightarrow{\max} 1 \Rightarrow y = \frac{3 + \varepsilon}{1 - 3} = \frac{\varepsilon}{-2} = -\frac{\varepsilon}{2}$

$\downarrow \delta_{\min} \xrightarrow{\min} -1 \Rightarrow y = \frac{3 - \varepsilon}{-1 - 3} = \frac{3 - \varepsilon}{-4} = -\frac{3 - \varepsilon}{4}$

$\delta_{\min} = 3 \Rightarrow$ صفری شود $\Rightarrow R_f = [-3, -\frac{1}{2}]$

1 - الف

$$y = \frac{x^2 - 1}{x} \quad x = \frac{-1}{x - 2} \Rightarrow R_f = \sqrt{1 - \left\{ \frac{1}{x} \right\}} \Rightarrow \sqrt{\frac{1}{x}} \quad (15)$$

بالنسبة $\Rightarrow R_f = [0, +\infty) - \left\{ \frac{1}{x} \right\}$

$$\sqrt{\frac{9x - 1}{x - 1}} = \sqrt{\frac{9(x - \frac{1}{9})}{x - 1}} = \sqrt{\frac{9}{x}} = \frac{3}{\sqrt{x}} \Rightarrow$$

$$R_f = \left\{ \frac{3}{x} \right\} \checkmark$$

9 - (2)

$$x/|x| - 2x = x(|x| - 2) \quad (2)$$

for $x > 0$ $x^2 - 2x \Rightarrow x_{\min} = \frac{1}{2} = 1 \Rightarrow y = 1 - 2 = -1 \Rightarrow R_f = [-1, +\infty) \quad (1)$

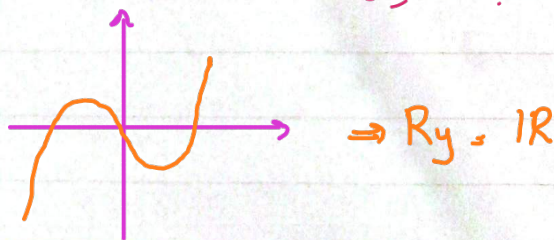
for $x < 0$ $-x^2 - 2x \Rightarrow x_{\max} = \frac{1}{-2} = -1 \Rightarrow -1 + 2 = 1 \Rightarrow R_f = (-\infty, 1] \quad (2)$

$(1) \cap (2) = (-\infty, +\infty) = \mathbb{R} \checkmark$

این سوالا با شکل خیلی راحت تره

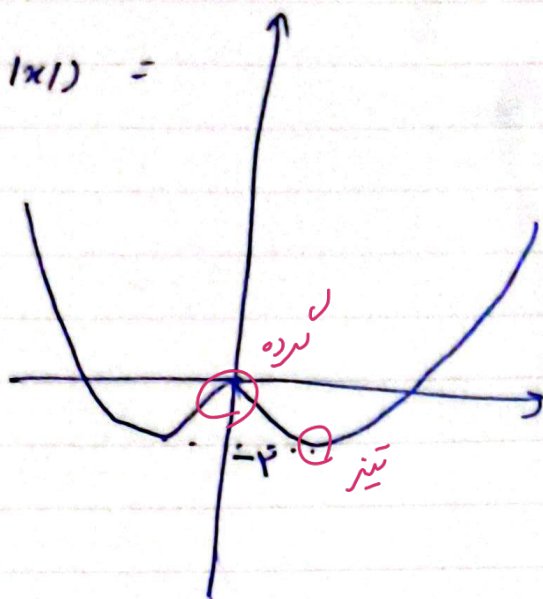
$$y = \begin{cases} x^2 - 2x & x \geq 0 \\ -x^2 - 2x & x < 0 \end{cases}$$

dotnote

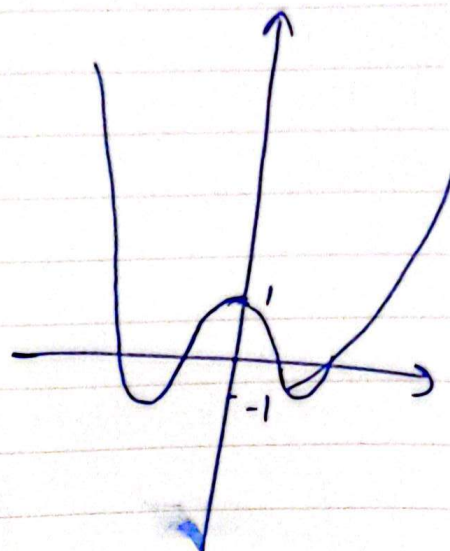


مُطبق‌خوار چون قریب‌است $f(x) = f(x)$ ۱۰ -

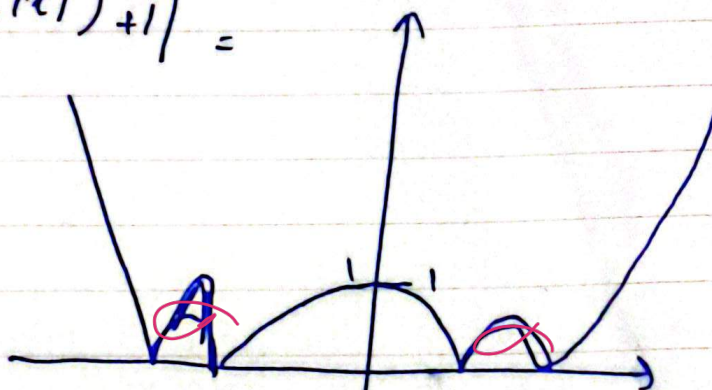
$$f(x) =$$



$$f(x) + 1 =$$



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



به دژه با مهره مر ستری ::

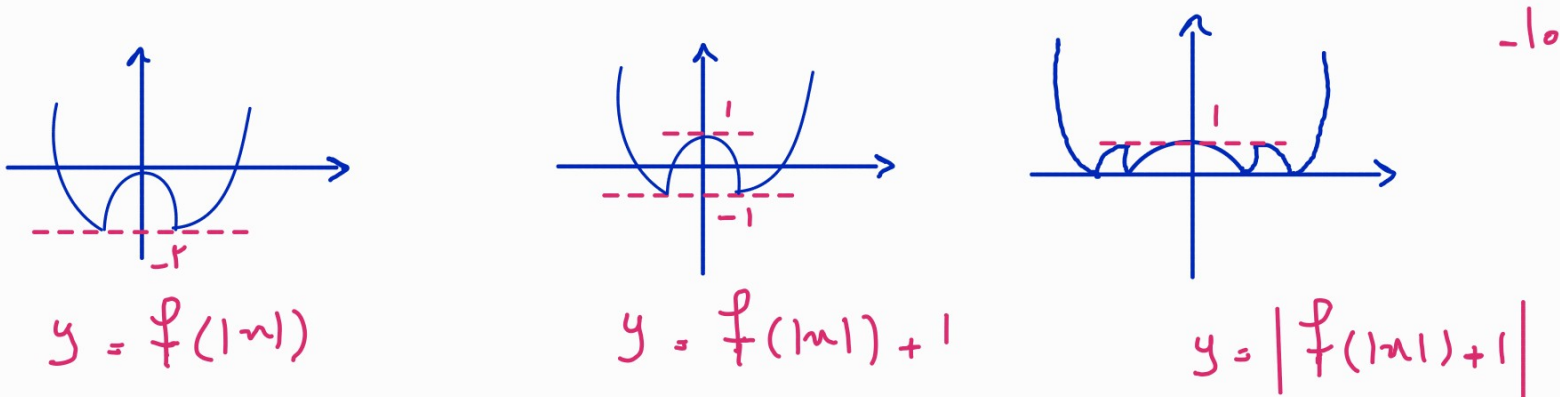
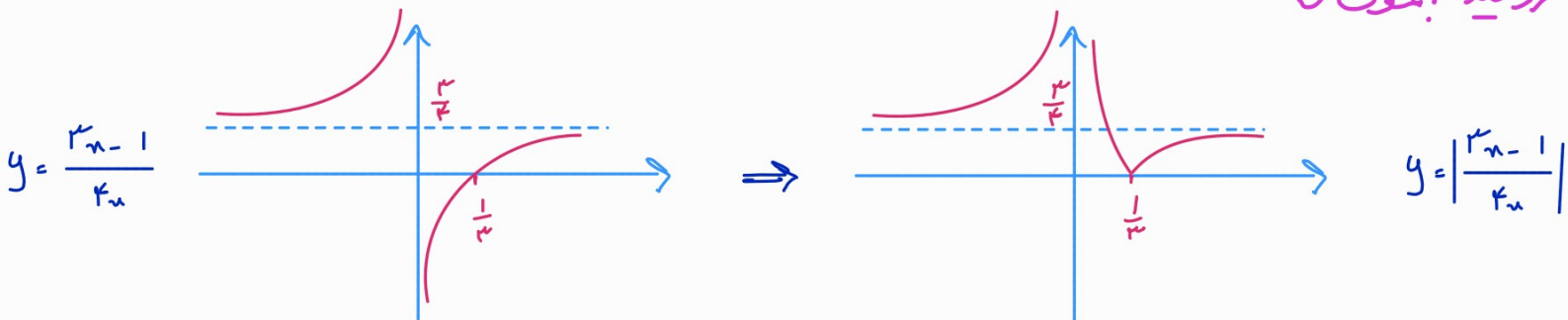
۱- بجای n ، $-n$ قرار می دهیم و یک دستگاه می سازیم:

$$\begin{aligned} f(-n) - n f(n) &= 2|n| + 1 \xrightarrow{\times n} \begin{cases} n f(-n) - n^2 f(n) = 2n|n| + n & (I) \\ f(n) + n f(-n) = 2|n| + 1 & (II) \end{cases} \\ f(n) + n f(-n) &= 2|n| + 1 \end{aligned}$$

$$\underline{II - I} \rightarrow (1 + n^2) f(n) = 2(1 - n)|n| + 1 - n \Rightarrow f(n) = \frac{(1 - n)(2|n| + 1)}{1 + n^2}$$

۸- اول برد عبارت داخل قدر مطلق
 رد حساب می کنیم بعد قدر مطلق می گیریم
 فقط خواست باشد 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 $y = \frac{3}{4}$

روید به نمودار:



۱۰-