

19, 75

تالیف

A یک اثر دینار دوازدهم رختان

الف) $2 \sin^2 \left(\alpha + \frac{\pi}{4} \right) - 1$

$\sin^2 \alpha \rightarrow 0 \rightarrow y = -1$
 $\rightarrow 1 \rightarrow y = 1$

$Ry = [-1, 1]$ ✓

①

②

ب) $3 \cos^2 \alpha - 2$

$\cos^2 \alpha \rightarrow -1 \rightarrow y = -7$
 $\rightarrow 1 \rightarrow y = 1$

$Ry = [-7, 1]$ ✓

③

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

$\alpha \in [-3, 3]$

$-3 < \alpha < -2$ $[\alpha] = -3$ $y = \frac{\alpha}{-3} - 3 = -4$

$-2 < \alpha < -1$ $[\alpha] = -2$ $y = \frac{\alpha}{-2} - 2 = -3$

$-1 < \alpha < 0$ $[\alpha] = -1$ $y = \frac{\alpha}{-1} - 1 = -2$

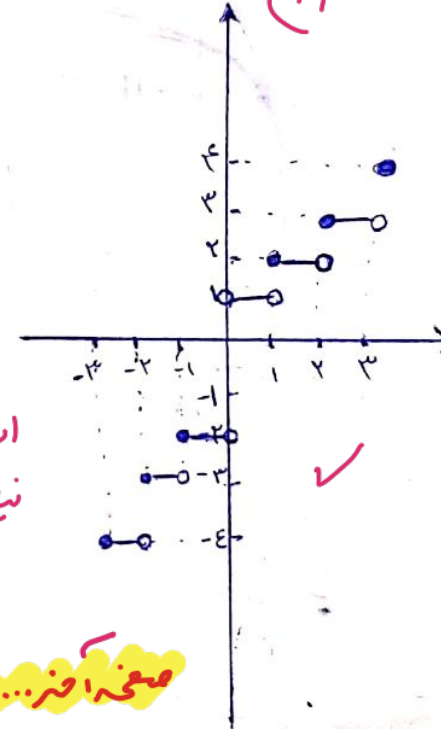
$0 < \alpha < 1$ $[\alpha] = 0$ $y = \frac{\alpha}{\alpha} + 0 = 1$

$1 < \alpha < 2$ $[\alpha] = 1$ $y = \frac{\alpha}{\alpha} + 1 = 2$

$2 < \alpha < 3$ $[\alpha] = 2$ $y = \frac{\alpha}{\alpha} + 2 = 3$

$\alpha = 3$ $[\alpha] = 3$ $y = \frac{\alpha}{\alpha} + 3 = 4$

انقضیه
نیاز نداشته



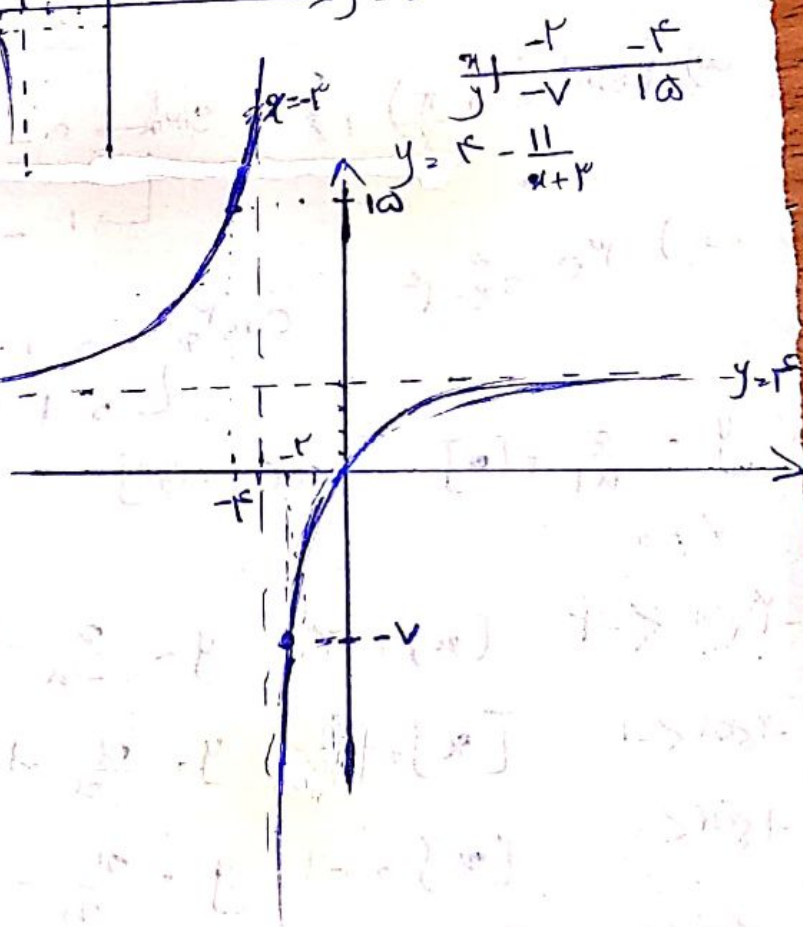
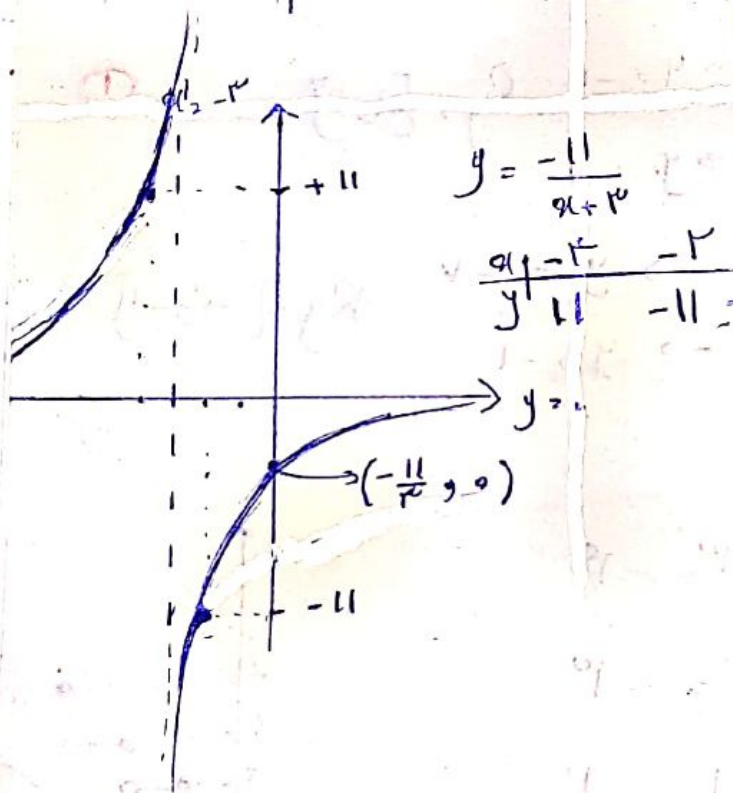
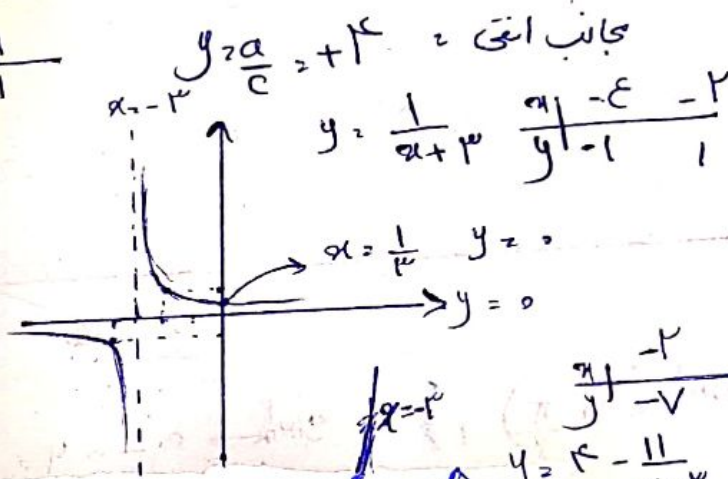
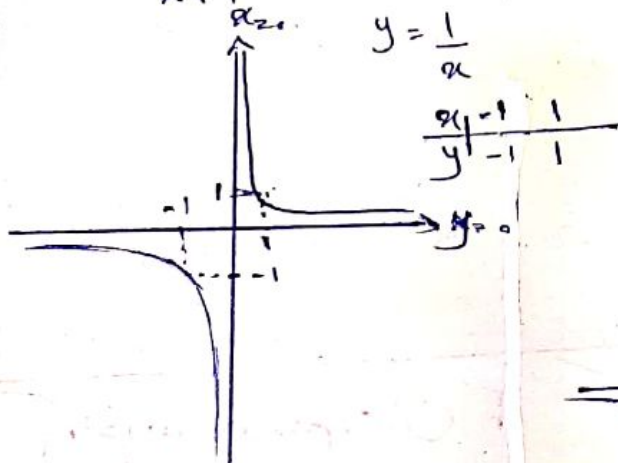
صحنه آخر...

$$y = \left| \frac{x+1}{x+3} \right|$$

$$= x - \frac{11}{x+3}$$

$$y' = \frac{x+1}{x+3} = \frac{x+1+11-11}{x+3} = \frac{x(x+3)}{x+3} - \frac{11}{x+3}$$

جانب ۲
عمودی



این نمودارها چه ریشه دارند؟

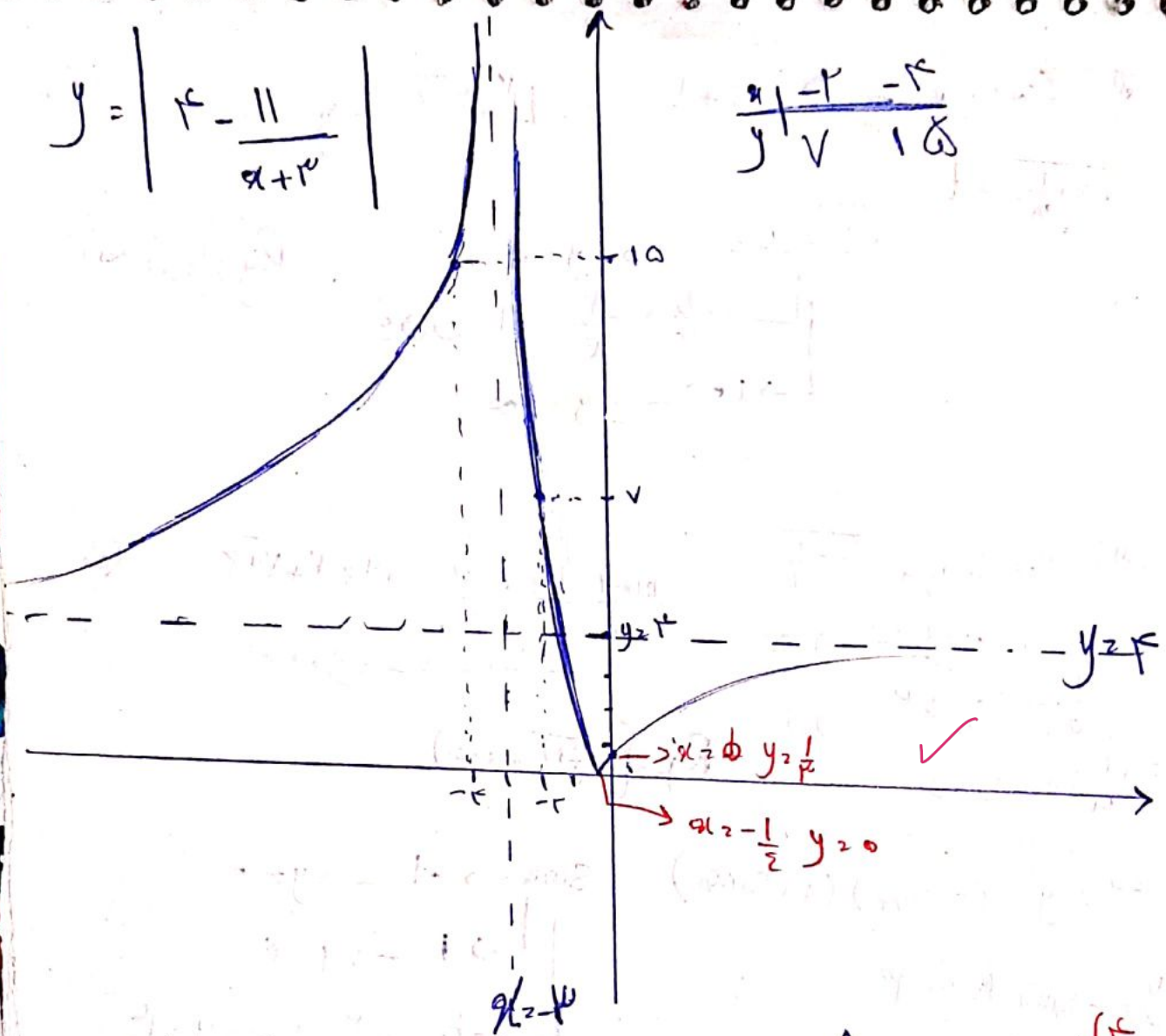
حافیه اول نمودار $y = \frac{x+1}{x+3}$ را رویش بعد قید مطلق بنویس دور خط، مفرها رو یاد
نکته قرینه نسبت به باد

صحنه آخر...

$$y = \left| \frac{x+1}{x+3} \right|$$

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

$$\frac{x-1}{y} = \frac{-1}{1 \pm y}$$



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

$$|y-1| = 1 - |x-1|$$

$$x \geq 1 \quad 1 - (x-1) = \pm(y-1)$$

$$1) \underline{y \geq 1} \quad 1 - x + 1 = y - 1$$

$$\boxed{-x + y = y}$$

$$2) \underline{y < 1} \quad 1 - x + 1 = 1 - y$$

$$\boxed{x - 1 = y}$$

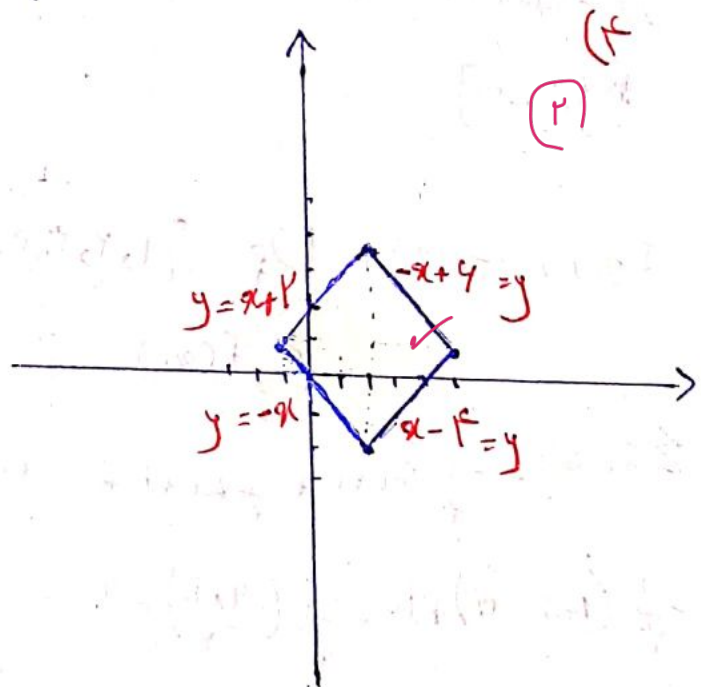
$$x < 1 \quad 1 - (1-x) = \pm(y-1)$$

$$1) \quad 1 - 1 + x = y - 1 \quad \boxed{x + 1 = y}$$

$$y \geq 1$$

$$2) \quad 1 - 1 + x = 1 - y \quad \boxed{-x = y}$$

$$y < 1$$



(1)

الف) $f(x) = x + \frac{1}{x} + \sqrt{x + \frac{1}{x}}$
 $x + \frac{1}{x} \xrightarrow{a < -2} a + \frac{1}{a} < -2$ غلط
 $\xrightarrow{a > 0} a + \frac{1}{a} \geq 2$ صحیح
 $x + \frac{1}{x} > 0$ چون زیر اعداد

$x + \frac{1}{x} \xrightarrow{\min} 2 \rightarrow y = 2 + 2\sqrt{2}$ (د)
 $\xrightarrow{\max} +\infty \rightarrow y = +\infty$ (۲)

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

ب) $y = (x - \sin x)(1 + \sin x)$

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

$R_y = [0, 2]$

$\sin x \rightarrow -1 \rightarrow y = 0$

$\rightarrow 1 \rightarrow y = 2$

$\rightarrow -\frac{b}{2a} = -\frac{1}{-2} = \frac{1}{2} \rightarrow y = 1$

$f(x) = -\frac{1}{x^2}x + 1$ $D_f = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ (۴)

$\sum f(x_i) = ?$

$\sum f(x_i) = -\frac{1}{x^2}x_1 + 1 + -\frac{1}{x^2}x_2 + 1 + \dots + -\frac{1}{x^2}x_9 + 1 = -\frac{1}{x^2}(x_1 + x_2 + \dots + x_9) + (9 \times 1)$

$-\frac{1}{x^2}(1 + 2 + \dots + 9) + 9 = -\frac{1}{x^2}\left(\frac{9 \times 10}{2}\right) + 9 = -\frac{45}{x^2} + 9 = \frac{36 - 45}{x^2} = -\frac{9}{x^2}$

$9 - 15 = -6$ (۵)

دست!

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

$$D_f = [r, +\infty)$$

$$-\frac{r}{x} +$$

(V)

(r)

$$y = \sqrt{bx + c}$$

$$x=r \rightarrow \sqrt{rb+c} = 1 \quad rb+c=1$$

$$y = \sqrt{bx + c} \xrightarrow{x=r} \sqrt{rb+c} = 0$$

$$\begin{cases} rb+c=1 \\ rb+c=0 \end{cases}$$

$$g(x) = \sqrt{x^2 + 0 - 1x(-1)} = \sqrt{x^2 + x}$$

$$b=1 \rightarrow c=-1$$

$$y' = x^2 + x \quad R_y = [r, +\infty)$$

$$R_g = [r, +\infty) \rightarrow [r, +\infty) \checkmark$$



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

$$D_f = \mathbb{R} - \{a, b\}$$

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

(1)
(r)

$$x \neq -r$$

$$f(x) = \frac{x(x^2 - \epsilon)}{x+r} = \frac{x(x-r)(x+r)}{(x+r)} = x^2 - rx \xrightarrow{x=r} r^2 - r = 1$$

$$x^2 - rx = 1 \quad x^2 - rx - 1 = 0 \quad (x-r)(x+r) = 0 \rightarrow x \neq r$$

$$D_f = \mathbb{R} - \{r, -r\} \quad a=r \quad b=-r \quad y = x^2 - rx \quad as = -(-r) = 1$$

$$R_f = [-1, +\infty) - \{1\} \quad c = -1 \quad y_s = -1 \quad R_y = [-1, +\infty)$$

$$f\left(\frac{a+b}{rc}\right) = f\left(\frac{r-r}{-r}\right) = f(-1) = \frac{(-1)^2 - \epsilon(-1)}{-1+r} = \frac{-1+\epsilon}{1} = 1 \checkmark$$

$$y = \sqrt[3]{x^3 + ax^2 + bx - 1} \rightarrow \text{فقطی} \quad (2) \quad (9)$$

فقطی ضابطہ زیر لکھا جائے گا
ملکب کا مل جائے گا

$$y = \sqrt[3]{(x+a)^3 - 1} = a^3 \quad a = -2$$

$$y = \sqrt[3]{(x-2)^3} = \sqrt[3]{x^3 + 12x - 4x^2 - 1} \quad a = -4$$

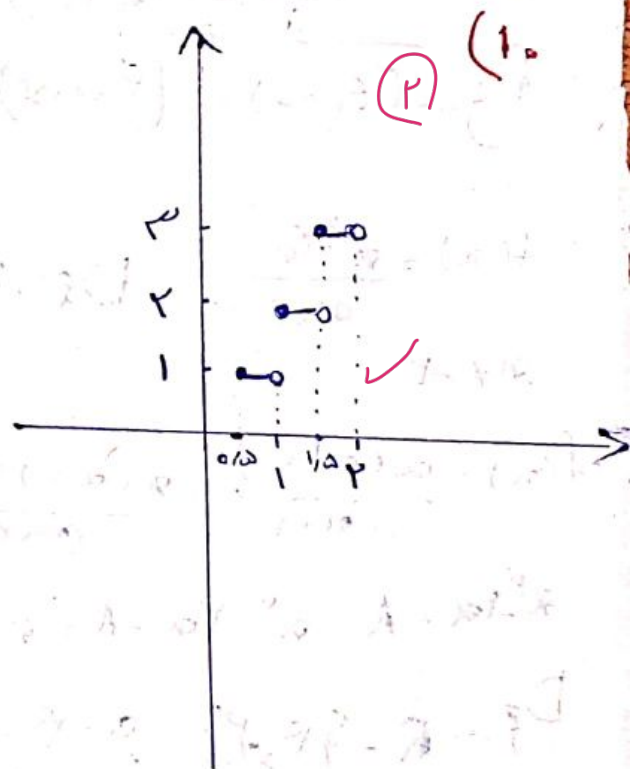
$$D_f = [-4, 12] \quad y = x-2 \quad R_f = [f(-4), f(12)] = [-1, 10]$$

$$y = [x] + [x + \frac{1}{x}] \quad \frac{1}{x} \leq x < 2$$

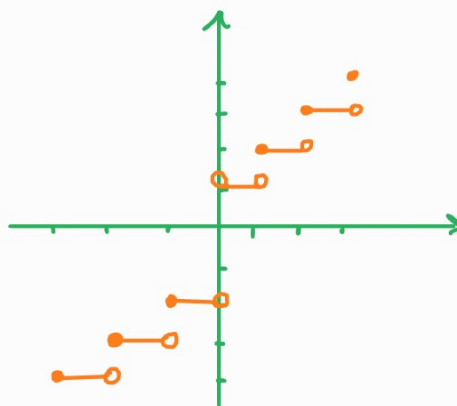
$$\frac{1}{x} \leq x < 1 \quad [x] = 0 \quad [x + \frac{1}{x}] = 1 \quad y = 1$$

$$1 \leq x < 1.5 \quad [x] = 1 \quad [x + \frac{1}{x}] = 1 \quad y = 2$$

$$1.5 \leq x < 2 \quad [x] = 1 \quad [x + \frac{1}{x}] = 2 \quad y = 3$$

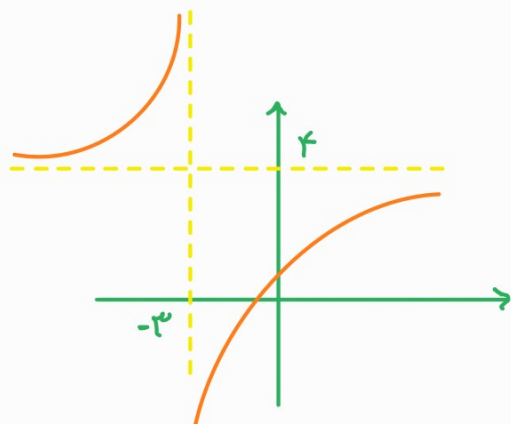


$$y = \begin{cases} [x] + 1 & x > 0 \\ [x] - 1 & x < 0 \end{cases} \Rightarrow$$



۲-

$$y = \frac{x+1}{x+3}$$



۳-

قدر مطلق دور خط، مقعر ها رو پاد میسنه قدرینه
میسنه بالات

$$y = \left| \frac{x+1}{x+3} \right|$$

