

$$f(-x) - x(f(x)) = r|x| + 1 \xrightarrow{-x} \begin{cases} f(-x) - xf(x) = r|x| + 1 & x < 0 \\ f(x) + xf(-x) = r|x| + 1 & x > 0 \end{cases} \quad (2) \quad (1)$$

$$+ \begin{cases} -xf(-x) + x^r f(x) = r|x|n + x & (x^r + 1)f(x) = (r|x| + 1)|x| + x + 1 \\ xf(-x) + f(x) = r|x| + 1 & f(x) = \frac{(r|x| + 1)(1 - x)}{1 + x^r} \end{cases}$$

$$f(x) + f(0) = x^r - rx + r \xrightarrow{x=0} f(0) + f(0) = 0 - r(0) + r \quad rf(0) = r \quad f(0) = r \quad (2) \quad (2)$$

$$\hookrightarrow f(x) = x^r - rx + r \xrightarrow{x^r} f(x^r) = (x^r)^r - r(x^r) + r$$

$$\hookrightarrow f(x^r) = x^r - rx^r + r$$

$$y = \frac{x^r + x + r}{x - 1} \quad yx - y = x^r + x + r \quad x^r + (1 - y)x + (y + r) = 0 \quad (2) \quad (3)$$

$$\Delta \geq 0 \quad (1 - y)^2 - 4(y + r) \geq 0 \quad y^2 - 4y - 4r \geq 0 \quad (y - 2)(y + 2 + r) \geq 0 \quad \begin{matrix} y \leq 1 \\ y \geq -r \end{matrix}$$

$$\rightarrow R = (-\infty, -1] \cup [r, +\infty)$$

$$\text{الف) } y = rx^r - \alpha x + 1 \xrightarrow{\alpha > 0} \min \left| \frac{-b}{2a} = \frac{\alpha}{r} \right| \quad y = r\left(\frac{r\alpha}{r^2}\right) - \frac{r\alpha}{r} + 1 = \frac{r\alpha - \alpha r}{r} + 1 = \frac{1}{r} \quad R = \left[\frac{1}{r}, +\infty\right) \quad (2) \quad (4)$$

$$\rightarrow y = \sqrt{-x^r + 4x - \alpha} \xrightarrow{\max} \left| \frac{-b}{2a} = \frac{4}{r} = r \right| \quad y = -9 + 11 - \alpha = r \quad R_1 = (-\infty, r] \xrightarrow{\sqrt{\quad}} [0, r] = R_y \quad (1, 4, 5)$$

$$\text{ب) } y = \sqrt{x^r - rx^r + rx + 1} \xrightarrow{\text{مشتق نگیرد}} R = \mathbb{R} \xrightarrow{\sqrt{\quad}} [0, +\infty)$$

$$\text{ج) } y = \log(x^r - 4x^r + 4x + r) \xrightarrow{\text{مشتق نگیرد}} R = \mathbb{R} \xrightarrow{\log} (-\infty, +\infty) \quad \text{صفتی ندارد}$$

$$\text{الف) } y = \frac{rx + 1}{rx - 4} \xrightarrow{\text{طبیعت کلی، بر مبنای R، ریشه صفر (صفر محذور)}} \frac{r}{r} \quad x \neq \frac{4}{r} \quad R = \mathbb{R} - \left\{\frac{4}{r}\right\} \quad (2) \quad (5)$$

$$\rightarrow y = \sqrt{\frac{rx + 1}{x - r}} \xrightarrow{\text{مشتق نگیرد}} R = \mathbb{R} - \{r\} \xrightarrow{\sqrt{\quad}} R = [0, +\infty) - \{r\}$$

$$\text{ب) } y = \frac{x^r + r}{\sqrt{x^r + r}} = \sqrt{x^r + r} + \frac{1}{\sqrt{x^r + r}} \xrightarrow{\alpha + \frac{1}{\alpha} \quad \alpha > 0} R = \left[\frac{r}{\sqrt{r}}, +\infty\right)$$

$$\sqrt{x^r + r} \xrightarrow{\min_{x=0}} \sqrt{r} \xrightarrow{\sqrt{\quad}} \frac{r}{\sqrt{r}}$$

$$\text{ج) } y = x^r + \frac{1}{x^r + r} \quad x^r \geq 0 \xrightarrow{\min_{x^r=0}} \frac{1}{r} = y_{\min} \quad R = \left[\frac{1}{r}, +\infty\right)$$

$$(y-x)^2 + (x-y) = x^2 + k \quad (x-y)^2 + (x-y) = x^2 + k$$

Subject:

Date:

$$x = \pm \sqrt{\frac{k-y}{x-y}}$$

$$x-y \neq 0 \quad y \neq x$$

$$R = (-\infty, -k] \cup (k, +\infty)$$

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

$$x^2 < +\infty$$

$$\frac{k}{-1} = -k$$

مخرج صفر نشود

$$(-\infty, -k] \cup (k, +\infty)$$

(2) (4)

$$f(x) = \frac{x \sin x + k}{\sin x - x}$$

$$-1 < \sin x < 1$$

$$\sin x = 1$$

$$\frac{x+k}{1-x} = \frac{4}{-1} = -4$$

$$|\sin x - 1|$$

$$\frac{-x+k}{-1-x} = \frac{k}{-1-x} = -\frac{1}{x}$$

مخرج صفر نشود

$$[-\frac{1}{x}, -k]$$

$$[-x, -\frac{1}{x}]$$

(2) (4)

$$y = \left| \frac{x^2 - 1}{kx} \right|$$

$$\frac{x}{k} - \frac{1}{kx}$$

$$x \neq 0$$

صفر نمی شود

بازه مقادیر

$$y \geq 0$$

$$\frac{x^2 - 1}{kx} = -\frac{x}{k}$$

صفر نمی شود

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

(1)

(1)

$$y = \sqrt{\frac{9x^2 - 11}{-4kx}}$$

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

$$f(x) = 1 \quad x = 2$$

$$R = [0, +\infty) \setminus \{\sqrt{2}\}$$

تابع ثابت

$$y = x|x| - 2x$$

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

$$x^2 - 2x \rightarrow x_2 = \frac{2}{2} = 1$$

$$1 - 2 = -1$$

$$x \geq 0$$

$$x(x-2) \rightarrow x=0$$

$$x=2$$

$$x_2 = \frac{2}{2} = -1$$

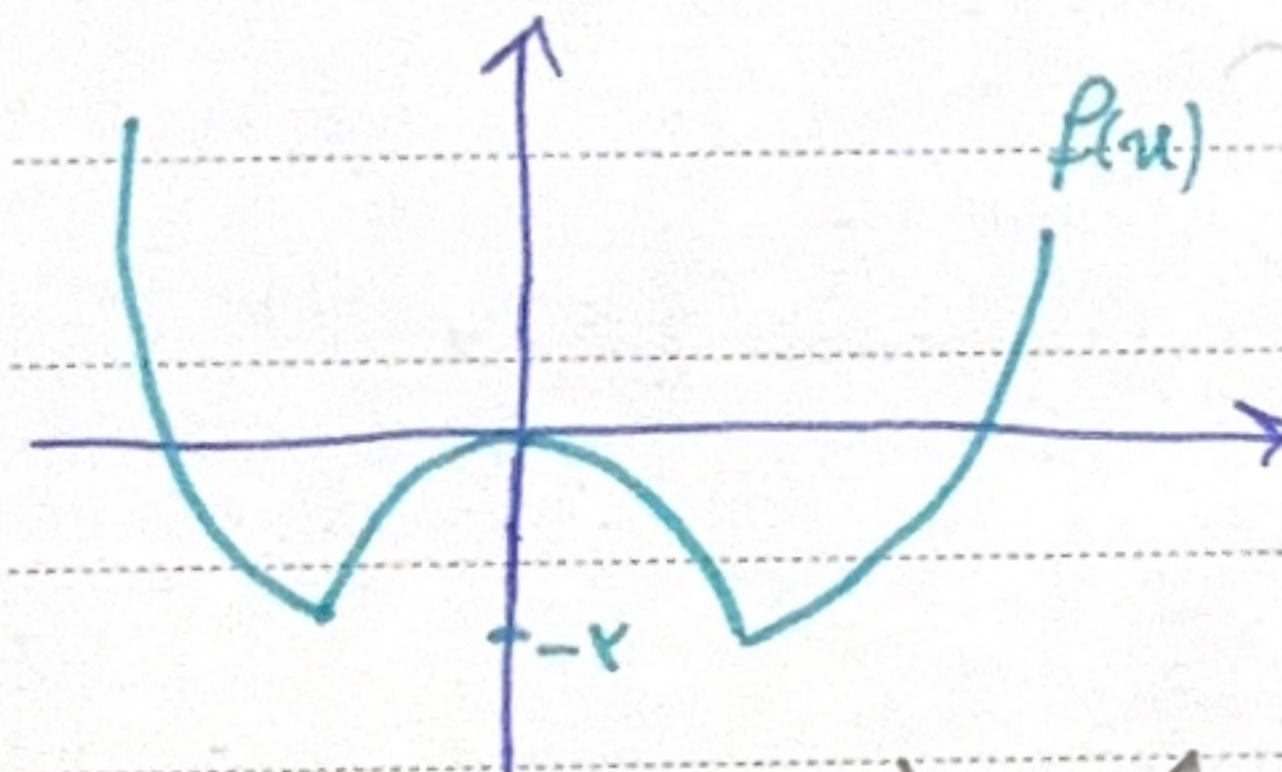
$$-1 + 2 = 1 \quad -x(x+2) \rightarrow x=0$$

$$x=-2$$



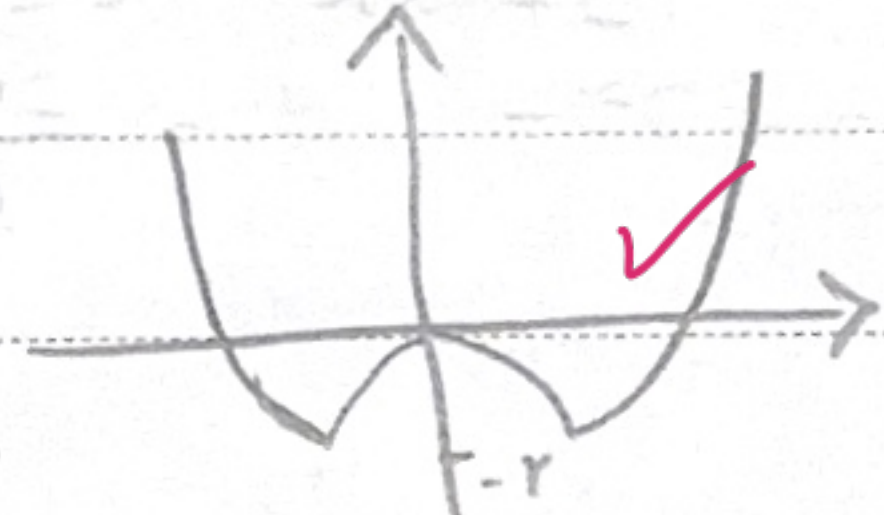
$$R = [0, +\infty)$$

(2) (4)



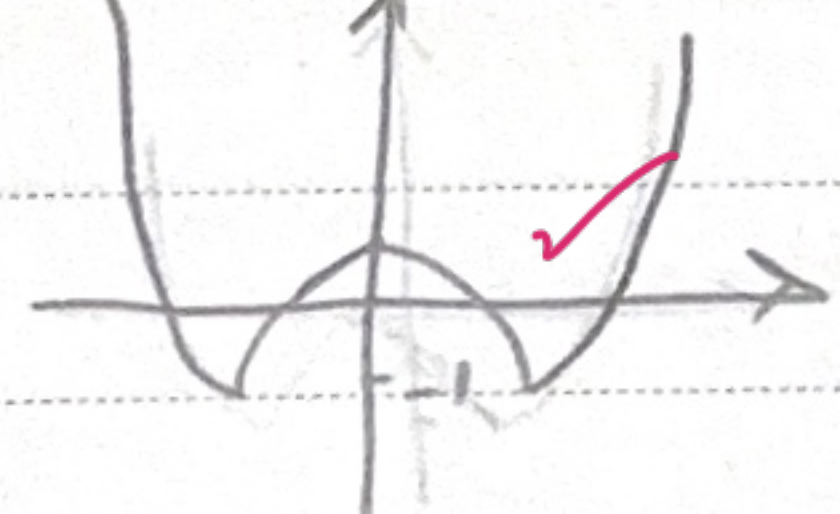
$$P(1|x|)$$

فرض کنیم
مستویات
و باقی موافق و نسبت
به محور x قرار می گیرند



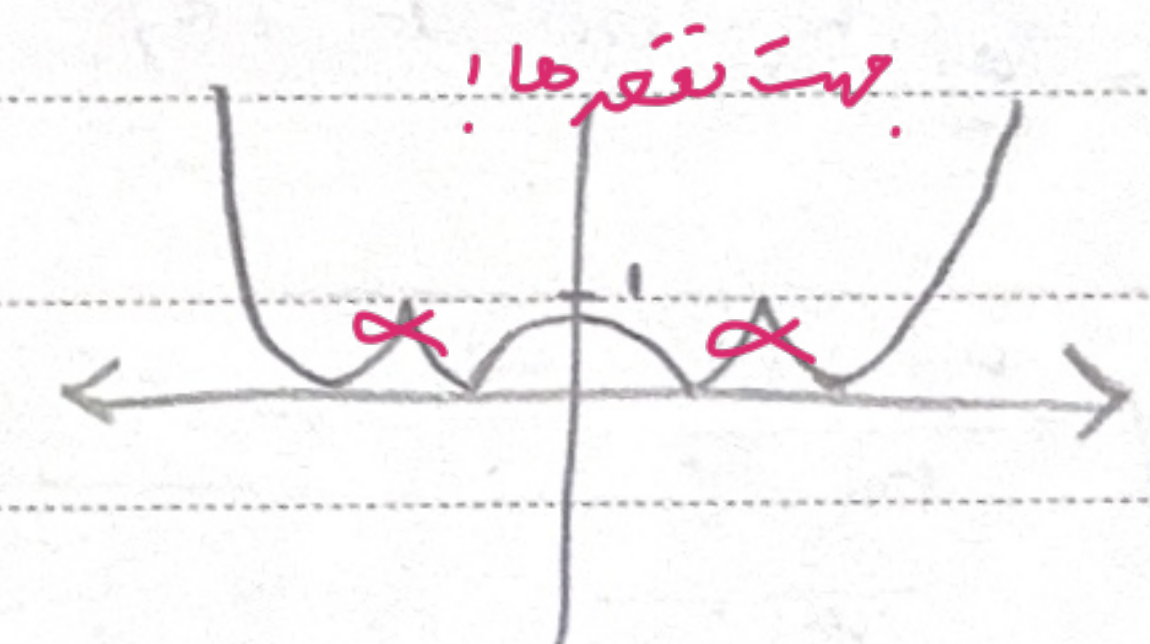
(1) (5)

$$P(x) + 1$$

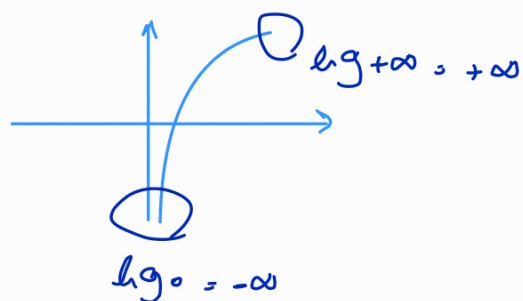


$$|P(x) + 1|$$

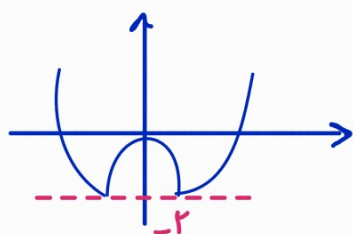
نسبت به محور x قرار می گیرند



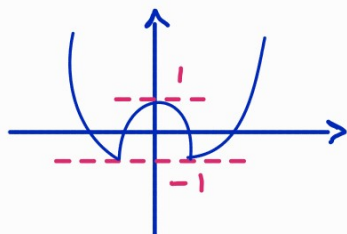
د) $\log |R| = \log(0, +\infty) = (-\infty, +\infty)$ جلوی نظایم همیشه هسته!



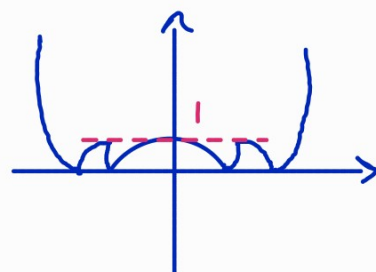
۱-ب) $y = \sqrt{\frac{a(x-r)}{f(x-r)}} = \sqrt{\frac{a}{f}} = \frac{r}{r} \rightarrow R_y = \{\frac{r}{r}\}$



$y = f(1-x)$



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



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