

۱۹،۵ افسر (:

$$f(-x) - xf'(x) = 17x + 1$$

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

$$\rightarrow x(f(-x) - x f(x)) = x(|x| + 1)$$

$$\rightarrow x f(-x) - x^r f(x) = x^r (r|x| + 1)$$

$$\begin{aligned} f(x) + x^r f(x) &= r|x|+1 - x(r|x|+1) \rightarrow |x| = 1-x \Rightarrow f(x)(1+x^r) = (r|x|+1)(1-x) \\ &\Rightarrow f(x) = \frac{(1-x)(r|x|+1)}{1+x^r} \end{aligned}$$

$$x=0 \rightarrow f(0) + f(0) = 4 = r f(0) \rightarrow f(0) = r \Rightarrow f(n) = n^r - r_{n-1} - \cancel{f(0)} = n^r - r_{n-1} - r$$

$$\rightarrow f(x^r) = (x^r)^r - 1^r(x^r) + 1^r = x^{r^2} - 1^r x^r + 1^r$$

$$y = \frac{x^r + x + r}{x-1} \Rightarrow yx - y = x^r + x + r \Rightarrow x^r + x - xy + r + y = 0 = x^r + (1-y)x + (y+r)$$

$$\rightarrow \Delta = (1-y)^T - \epsilon(y+r) = 1 - ry + y^T - \epsilon y - \wedge = y^T - ry - \wedge$$

$$\rightarrow x = \frac{(y-1) \pm \sqrt{y^2 - 4y - v}}{r} \rightarrow y^2 - 4y - v \geq 0 \rightarrow (y-v)(y+1) \geq 0 \Rightarrow R_f = 1R - (-1, v)$$

الف) رأس سهم = $\frac{5}{r} = x \rightarrow r(\frac{20}{14}) - 5(\frac{5}{r}) + 1 = \frac{20}{\lambda} - \frac{25}{\lambda} + \frac{1}{\lambda} = \frac{-6}{\lambda} \rightarrow R_f = [\frac{1}{\lambda}, +\infty)$
 $\lambda = 2 > 0$

جواب: $x = \frac{-4}{-1} = 4 \rightarrow -4 + 4 \times 3 - 2 = 11 - 4 - 2 = 5 \rightarrow R = (-\infty, 5]$

$$\rightarrow \sqrt{(-\infty, r]} = [0, r] = R_f$$

ج) $\rightarrow$ بدست می آید $R = \mathbb{R} \rightarrow \sqrt{R} = [0, +\infty) = R_f$

د) $\Rightarrow R = IR \rightarrow \log IR = \log(0, +\infty) = IR = R_f$ بد عبارت جدول را در نظر

الف) $R_f = 1R - \left\{ \frac{a}{c} \right\} \rightarrow \frac{a}{c} = \frac{r}{t} \rightarrow R_f = 1R - \left\{ \frac{r}{t} \right\}$

بدرستی زیر را دیکت کنید (ب) : $\mathbb{R} - \left\{ \frac{a}{c} \right\} = \mathbb{R} - \{F\} \rightarrow R_F = \sqrt{\mathbb{R} - \{F\}} = [0, +\infty) - \{r\}$

$$c) \frac{x^{r+\epsilon}}{\sqrt{x^{r+\mu}}} = \frac{x^{r+\mu+1}}{\sqrt{x^{r+\mu}}} = \frac{x^{r+\mu}}{\sqrt{x^{r+\mu}}} + \frac{1}{\sqrt{x^{r+\mu}}} = \sqrt{x^{r+\mu}} + \frac{1}{\sqrt{x^{r+\mu}}} \xrightarrow[\text{L'Hôpital}]{\text{L'Hôpital}} \sqrt{\mu} + \frac{1}{\sqrt{\mu}} = \sqrt{\mu}$$

 $x^{r+\epsilon} + \frac{1}{x^{\epsilon}} - \epsilon \Rightarrow x^{r+\epsilon} + \frac{1}{x^{\epsilon}} \xrightarrow[\text{L'Hôpital}]{} R_f = \left(\frac{\epsilon}{\mu}, +\infty \right)$

$\Rightarrow x_1^* \in + \frac{1}{x_1^* + 2} - \varepsilon \Rightarrow x_1^* \in + \frac{1}{x_1^* + 2}$

$$1) y = \frac{x^2 + 4}{x^2 - 1} \rightarrow yx^2 - y = x^2 + 4 \rightarrow yx^2 - x^2 = 4 + y = x^2(y - 1) \rightarrow x^2 = \frac{4 + y}{y - 1}$$

$$\rightarrow \frac{4 + y}{y - 1} \geq 0 \rightarrow \frac{-4}{+4 - 1} \rightarrow R_f = (-\infty, -4] \cup (1, +\infty)$$

مقدارهای نهایی پیدا کنید. توابع نیست!

$$2) x^2 \geq 0 \rightarrow x^2 = 0 : y = \frac{4}{-1} = -4, \quad x^2 = +\infty \rightarrow y = \frac{x^2}{x^2} = 1$$

$$\rightarrow \text{خرج می تواند صفر شود} : x^2 - 1 = 0 \rightarrow x = \pm 1 \Rightarrow R_f = (-\infty, -4] \cup (1, +\infty)$$

$$-1 \leq \sin x \leq 1 \rightarrow \sin x = 1 : y = \frac{2(1) + 4}{1 - 4} = \frac{6}{-3} = -2$$

$$\sin x = -1 : y = \frac{2(-1) + 4}{-1 - 4} = \frac{2}{-5} = -\frac{2}{5}$$

$$\sin x - 2 = 0 \rightarrow \sin x = 2 \rightarrow \text{غیر ممکن} \Rightarrow R_f = [-\frac{2}{5}, -2]$$

$$[-2, -\frac{2}{5}]$$

$$\text{الف) رسم مثلث : } g = \frac{x^2 - 1}{4x} \rightarrow \text{مجاوب قائم } x = 0 \rightarrow \text{مجاوب افقی } g = \frac{a}{c} = \frac{1}{4} \rightarrow x = 1 : y = \frac{1}{4}$$

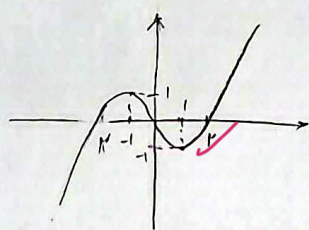
$$\rightarrow g = \left| \frac{x^2 - 1}{4x} \right| : \Rightarrow R_f = [0, +\infty)$$

$$\text{ب) } g = \sqrt{\frac{4(x-2)}{x(x-2)}} = \sqrt{\frac{4}{x}} = \frac{2}{\sqrt{x}} \rightarrow R_f = \left\{ \frac{2}{\sqrt{x}} \right\}$$

(دایره تابع، نقطه ای $(2, \frac{2}{\sqrt{2}})$ به رسم می کشیم. تابع است توخالی است. اما چون تابع ثابت است تفاوتی ایجاد نمی کند)

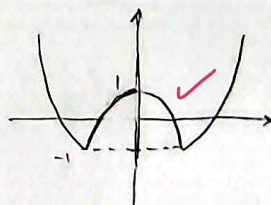
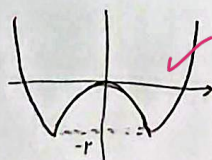
$$x > 0 \rightarrow y = x^2 - 2x$$

$$x < 0 \rightarrow y = -x^2 - 2x$$



$$\rightarrow R_f = \mathbb{R}$$

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



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

