

A در رسم زده

1A, 1A

نکته ها

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$$f(-n) = x f(n) \cdot r|n|+1 \quad f(n) + n f(-n) = r|n|+1 \quad f(-n) = n f(n) \cdot r|n|+1$$

$$\ominus f(n) + n f(-n) \cdot r|n|+1$$

$$f(-n) = r|n|+1 + n f(n)$$

$$f(n) + n(r|n|+1 + n f(n)) = r|n|+1$$

$$(1+n^2) f(n) + (r|n|+1)n = r|n|+1$$

$$f(n) = \frac{(r|n|+1)(1-n)}{1+n^2}$$

$$f(n) = x^r - r_n + r$$

$$f(n^r) = x^r - r_n^r + r$$

$$f(n) + f(-n) = r^r - r_n + r$$

$$n \rightarrow f(n) = r \rightarrow f(-n) = r$$

$$xy - y = n^r + n + r \rightarrow n^r + (1-y)n + (r+y) = 0 \rightarrow n = \frac{y-1 \pm \sqrt{(1-y)^2 - 4(r+y)(1)}}{2}$$

$$\rightarrow y^r - ry - v = 0 \rightarrow (y-v)(y+1) + \frac{-1}{4} - \frac{v}{4} + \rightarrow R_f = (-\infty, -1] \cup [v, +\infty)$$

$$الف) y = n^r - an + 1 \rightarrow \frac{-a}{2a} = \frac{\sqrt{a^2 - 4(1)(1)}}{2} = \frac{-1}{2} \rightarrow R_f = [-\frac{1}{2}, +\infty)$$

$$ب) y = \sqrt{n^r + rn - a} \rightarrow \frac{-a}{2a} = \frac{-(r-4(a))}{-4} = \frac{-1}{4} = \frac{1}{4} \rightarrow R_f = [0, 1] \rightarrow (-\infty, 1]$$

$$ج) y = \sqrt{n^r - rn^r + rn + 1} \rightarrow \mathbb{R} \rightarrow R_f = [0, +\infty)$$

$$د) y = \deg n^r - rn^r + rn + \varepsilon \rightarrow R_f = (-\infty, +\infty)$$

$$الف) y = \frac{r^n + 1}{r^n - r} \quad \mathbb{R} - \left\{ \frac{a}{c} \right\} \rightarrow \mathbb{R} - \left\{ \frac{r}{r} \right\}$$

$$ب) y = \sqrt{\frac{r^n + 1}{n - r}} \rightarrow \mathbb{R} - \{r\} \rightarrow [0, +\infty) - \{r\}$$

$$ج) y = \frac{n^r + \varepsilon}{\sqrt{n^r + r}} + \frac{1}{\sqrt{n^r + r}} \rightarrow R_f = \left[\frac{\varepsilon}{\sqrt{r}}, +\infty \right)$$

$$د) y = x^r + \frac{1}{n^r + \varepsilon} \rightarrow \left[n^r + \varepsilon + \frac{1}{n^r + \varepsilon} \right] - r \rightarrow R_f = \left[\frac{1}{\varepsilon}, +\infty \right)$$

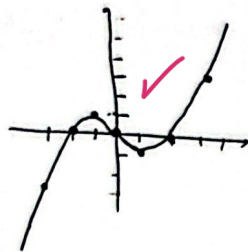
ad ≠ bc

$y = \frac{x^2 + 4}{x^2 - 1}$ روش اول: $y = \frac{x^2 + 4}{x^2 - 1} \rightarrow y(x^2 - 1) = x^2 + 4 \rightarrow yx^2 - y = x^2 + 4 \rightarrow yx^2 - x^2 = y + 4 \rightarrow x^2(y - 1) = y + 4 \rightarrow x^2 = \frac{y + 4}{y - 1} \rightarrow x = \pm \sqrt{\frac{y + 4}{y - 1}}$ (1)
 $\frac{-4}{9} < \frac{y}{3} < \frac{4}{3} \rightarrow R_f = (-\infty, -\frac{4}{3}] \cup (\frac{4}{3}, +\infty)$ روش دوم: $x^2 = t \rightarrow \frac{t + 4}{t - 1} \geq 0 \rightarrow \frac{t + 4}{t - 1} \geq 0 \rightarrow t \geq -4 \rightarrow R_f = (-\infty, -4] \cup (1, +\infty)$ (7)

$y = \frac{2 \sin x + 4}{\sin x - 3} \quad -1 \leq \sin x \leq 1$

$1 \rightarrow \frac{2}{-2} = -1$
 $-1 \rightarrow \frac{2}{-4} = -\frac{1}{2}$
 $R_f = [-\frac{1}{2}, -1]$

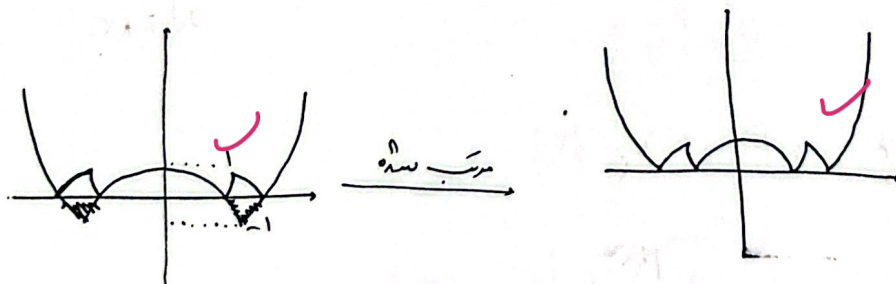
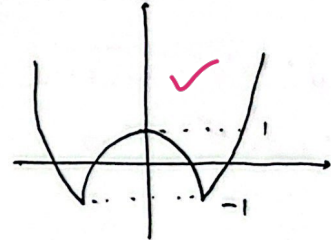
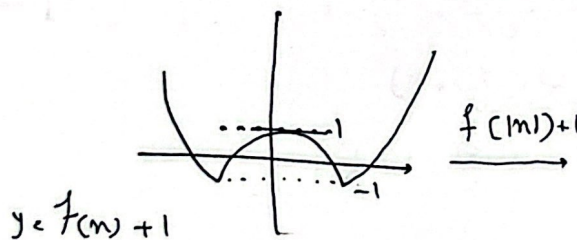
این شکل که خود نشی برداشته $(0, +\infty)$ بود: $y = \left| \frac{x^2 - 1}{x^2} \right|$ (الف) $y = \frac{x^2}{x^2 - 1}$ (ب)
 $y = \frac{x^2}{x^2 - 1} \rightarrow y(x^2 - 1) = x^2 \rightarrow yx^2 - y = x^2 \rightarrow yx^2 - x^2 = y \rightarrow x^2(y - 1) = y \rightarrow x^2 = \frac{y}{y - 1} \rightarrow x = \pm \sqrt{\frac{y}{y - 1}}$
 $R_f = [0, 1)$ فقط قسمت راست! قرینه نیست!!
 $y = \frac{x^2}{x^2 - 1} \rightarrow y(x^2 - 1) = x^2 \rightarrow yx^2 - y = x^2 \rightarrow yx^2 - x^2 = y \rightarrow x^2(y - 1) = y \rightarrow x^2 = \frac{y}{y - 1} \rightarrow x = \pm \sqrt{\frac{y}{y - 1}}$ (15)



$-x^2 - 2x$	$x^2 - 2x$
$-1 \rightarrow -1 + 2 = 1$	$1 \rightarrow -1$
$-2 \rightarrow -4 + 4 = 0$	$2 \rightarrow 0$
$-3 \rightarrow -9 + 6 = -3$	$3 \rightarrow 3$
	$4 \rightarrow 4$

$y = |x| - 2x$ برعکس (2)
 $R_f = \mathbb{R}$

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



نکته: $x = x^2 \rightarrow \begin{cases} x^2 = 0 \rightarrow y = -4 \\ x^2 \sim \infty \rightarrow y = 3 \end{cases} \xrightarrow{\text{محدوده میوه}} R_y = (-\infty, -4] \cup (3, +\infty)$