

14 CS, LOS W

$$\Gamma(n+1) = \Gamma(n) + n \Gamma(n) = \Gamma(n) + 1$$

$$\Gamma(n) - n \Gamma(n) = \Gamma(n) + 1$$

$$\Rightarrow \Gamma(n) = \Gamma(n) + n \Gamma(n) + 1$$

$$\Gamma(n) + n \Gamma(n) + n = \Gamma(n) + 1$$

$$\Gamma(n) (1+n) + n = \Gamma(n) + 1$$

$$(1+n) \Gamma(n) = \Gamma(n) + 1$$

$$\Gamma(n) = \frac{\Gamma(n) + 1}{(1+n)}$$

$$\nabla \rightarrow n=0 \Rightarrow \nabla f(x_0) = (0, 1)^T - \mu(0, 1) + \gamma \rightarrow \nabla f(x_0) = \gamma$$

$$f(x_0) = \mu$$

$$\Rightarrow f(n) + \mu = n^T - \mu n + \gamma \rightarrow f(n) = n^T - \mu n + \mu$$

$$\rightarrow f(n^T) = (n^T)^T - \mu(n^T) + \mu = n^T - \mu n^T + \mu \checkmark$$

$$y = \frac{n^T + n + \mu}{n-1} \Rightarrow y(n-1) = n^T + n + \mu$$

$$\Rightarrow n^T + (1-y)n + y + \mu = 0$$

$$n = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow n = \frac{y-1 \pm \sqrt{(1-y)^2 - 4(y+\mu)}}{2} \geq 0$$

$$\Rightarrow y^T - y + 1 - 4(y+\mu) > 0 \rightarrow y^T - 4y - 4\mu > 0$$

$$\Rightarrow R_f = (-1, \mu) \rightarrow R = (-1, \mu) \checkmark$$

$$\text{الف) } \nabla n^T - \mu n + 1 \rightarrow \left. \frac{\partial}{\partial n} \right|_{\text{ent}} = \frac{-\Delta}{2a} = \frac{-(2\mu - 1)}{1} = \frac{-1\mu}{1}$$

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

$$\text{ب) } \sqrt{-n^T + 4n - \mu} \rightarrow -n^T + 4n - \mu \rightarrow \left. \frac{\partial}{\partial n} \right|_{\text{ent}} = \frac{-(4 - 2n)}{-1} = 4 - 2n$$

$$R_{??}$$

$$\text{ب) } S \Big|_{\mu} \Rightarrow R_y = \sqrt{[-\infty, 4]} = [0, 2]$$

2) $\sqrt{x^2 - 3x^2 + 4x + 1} \rightarrow x^2 - 3x^2 + 4x + 1 \Rightarrow R = \sqrt{R_1} = [0, +\infty)$
 چون از 0 فرد است.

3) $\text{let } (x^3 - 4x^2 + 6x + 4) \rightarrow (-\infty, +\infty) = R_p$
 همیشه فرد

4) الف $\frac{x^2 + 1}{x - 4} \Rightarrow R_f = R_1 - \left\{ \frac{4}{1} \right\}$ (1, 4)

ب) $\sqrt{\frac{4x + 1}{x - 2}} = R - \left\{ \sqrt{\frac{4}{-2}} \right\} R_y = \sqrt{R - \left\{ \frac{4}{-2} \right\}} = [0, +\infty) - \left\{ \frac{2}{-1} \right\}$
 رادیکال رو طسش بناد نه معطاف

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

$\Rightarrow \left\{ \sqrt{x^2 + 3} + \frac{1}{\sqrt{x^2 + 3}} \right\} \min x = 0 \rightarrow \min = \sqrt{3} + \frac{1}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

$\Rightarrow R = \left[\frac{4}{\sqrt{3}}, +\infty \right)$

5) $y = \frac{3x^2 + 4}{x^2 - 1} \rightarrow yx^2 - y = 3x^2 + 4$
 اولی $(3 - y)x^2 + (4 + y) = 0$ (1, 5)

چقدر شخص بردی

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{\pm \sqrt{0 - 4 \left(\frac{y+4}{y-3} \right) (y+3)}}{2(3-y)}$
 $\Delta \geq 0$
 $4(y+4)(y+3) \geq 0$
 $(y+4)(y+3) \geq 0$
 $y \leq -4$ یا $y \geq -3$
 $3 - y \neq 0 \Rightarrow y \neq 3 \Rightarrow R_f = (-\infty, -4] \cup (-3, +\infty)$

صفر آفر

$\frac{-4}{+} \frac{3}{-} \Rightarrow R_f = (-\infty, -4] \cup (-3, +\infty)$

1) $\text{max} \rightarrow x^2 = +\infty \rightarrow y = 3$

$\min \rightarrow x^2 = 0 \rightarrow y = -4$
 ریشه خارج = 1 است بوده
 که در بازه وجود دارد پس
 بد در خارج این بازه نیست
 تو بر طس!

$R = R_1 - [-4, 3]$

$$\lim_{n \rightarrow \infty} \frac{r \ln n + r}{\ln n - r} \xrightarrow{\frac{\infty}{\infty}} y = \frac{r}{-r} = -1$$

$$\lim_{n \rightarrow \infty} \frac{r}{\ln n} = -\frac{r}{r} = -1$$

$$\Rightarrow R = [-r, \frac{1}{r}]$$

$$y = \left| \frac{r n - 1}{\ln n} \right|$$

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

$$\sqrt{\frac{g(n, r)}{f(n, r)}} = \left\{ \frac{r}{r} \right\} = R$$

$$\frac{-n^r - rn}{n^r - rn}$$

$$-(n^r + rn)$$

$$R = R$$

$$f(n) \rightarrow |f(n) + 1|$$

$$f(n) + 1$$

$$\text{روش اولی: } yx^2 - y = 3x^2 + 4 \rightarrow (y-3)x^2 = y+4 \quad -4$$

$$x^2 = \frac{y+4}{y-3} \geq 0 \rightarrow \frac{-4}{+4} \quad \frac{3}{-1} \quad \Rightarrow R_y = (-\infty, -4] \cup (3, +\infty)$$

$$\text{روش دوم: } \square = x^2 \rightarrow \begin{cases} x^2 = 0 \rightarrow y = -4 \\ x^2 \sim \infty \rightarrow y = 3 \end{cases} \xrightarrow[\text{صفه ششم}]{\text{محدوده میانه}} R_y = (-\infty, -4] \cup (3, +\infty)$$