

تأليف

17, 8

الأساس

$$y^{n-1} - y = n^2 \log^2 \Rightarrow n^2 \log^2 (1-y) + (1-y) = 0 \Rightarrow \Delta > 0 \quad (1)$$

$$y^2 - 4y - 1 > 0 \Rightarrow y_0 = \frac{4 \pm \sqrt{16+4}}{2} = -1, 5 \Rightarrow \frac{-1}{2} \mid \frac{5}{2}$$

$$\Rightarrow R_f = (-\infty, -1] \cup [5, +\infty) \quad \checkmark$$

الف) $a > 0 \Rightarrow \min = \frac{-1}{f_a} \Rightarrow \frac{-16}{1} \Rightarrow R_f = [-16, +\infty) \quad (2)$

ب) $a < 0 \Rightarrow \max = \frac{-1}{f_a} \Rightarrow \frac{-16}{-1} \Rightarrow R_f = [0, 16] \quad \checkmark$

ج) $n^2 \log^2 f_n \rightarrow 0 \Rightarrow R_f = [0, +\infty) \quad \checkmark$

د) $\log n^2 \log^2 f_n \rightarrow \mathbb{R} \Rightarrow \log n^2 \log^2 f_n \rightarrow \mathbb{R} \Rightarrow R_f = \mathbb{R} \quad \checkmark$

الف) $y, \frac{n^2 \log^2}{n-1} \rightarrow -\frac{-4y-1}{2y-1}, \frac{4y+1}{2y-1} \Rightarrow R_f = \mathbb{R} - \left\{ \frac{1}{2} \right\} \quad (3)$

ب) $y, \sqrt{\frac{f_n \log^2}{n-1}} \Rightarrow x = \frac{2y+1}{y-1} \Rightarrow R_f = [0, +\infty) - \left\{ \frac{1}{2} \right\} \quad \checkmark$

ج) $\frac{n^2 \log^2}{n \log^2} = \sqrt{n \log^2} \Rightarrow \frac{1}{\sqrt{n \log^2}} \Rightarrow R_f = \left[\frac{1}{\sqrt{n}}, +\infty \right) \quad \checkmark$

د) $n \log^2 \frac{1}{n \log^2} \rightarrow \frac{1}{n \log^2} \Rightarrow \frac{1}{n \log^2} - f \Rightarrow R_f = \left[\frac{1}{f}, +\infty \right) \quad \checkmark$

$$① y = \frac{y^2}{y^2 - 1} \Rightarrow n^2 = \frac{-(f''(y))}{f'(y)} \Rightarrow n = \sqrt{\frac{-(f''(y))}{f'(y)}}$$

(1)

$$\frac{-1}{-1} \Rightarrow Df = (-\infty, -1] \cup (1, \infty)$$

$$② x^2 \rightarrow \max z = +\infty \rightarrow f(\infty) = \infty$$

$$\hookrightarrow \min z = 0 \rightarrow f(0) = -1$$

$$① y = \frac{y \sin n - 1}{\sin n} \Rightarrow \sin n = \frac{-y - 1}{y - 1} \Rightarrow y = \frac{1}{1 - \sin n}$$

(1)

$$\Rightarrow -\frac{1}{y} > y - 1 \Rightarrow y > \frac{1}{2} \text{ and } y < 1 \Rightarrow Df = \left[\frac{1}{2}, 1\right]$$

$$② \sin n \rightarrow \max = 1 \rightarrow y = \frac{1}{2}$$

$$\hookrightarrow \min = -1 \rightarrow y = -\frac{1}{2}$$

$$1. Df = \mathbb{R} - \left\{ \frac{1}{2}, -\frac{1}{2} \right\} \Rightarrow Df = \mathbb{R}$$

(1, 2, 3)

$$f: y = \frac{y^2 - y + 1}{y^2 - 1} \Rightarrow \lambda^2 - y + \frac{1}{y} \Rightarrow (y-1) \left(\frac{1}{y} - 1 \right) = 0$$

$$y = (y-1) \pm \sqrt{(y-1)^2 - 1} \in (y-1) \left(y - \frac{1}{2} \right) \Rightarrow Df = [0, 1]$$

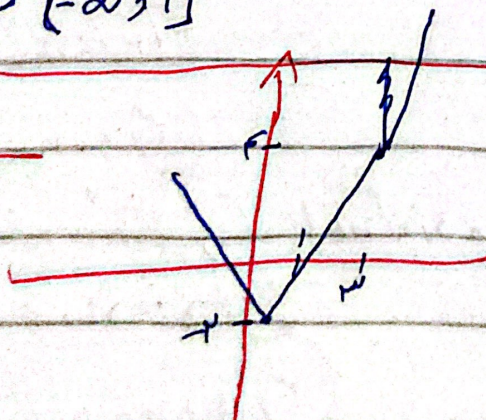
$$\Rightarrow \Delta > 0 \Rightarrow y^2 - y + 1 - y^2 + \frac{y-1}{y} = \frac{y^2 - y + 1 - y^2 + y - 1}{y} = \frac{0}{y} = 0$$

$$\Rightarrow \frac{1}{y} > y - 1 \Rightarrow y > \frac{1}{2} \Rightarrow Df = \left[\frac{1}{2}, \infty \right)$$

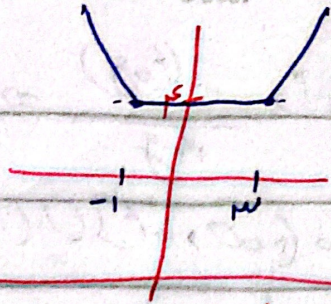
$$\frac{1}{y} \Rightarrow \frac{1}{-1} \Rightarrow \frac{1}{1} \Rightarrow \frac{1}{2}$$

(2)

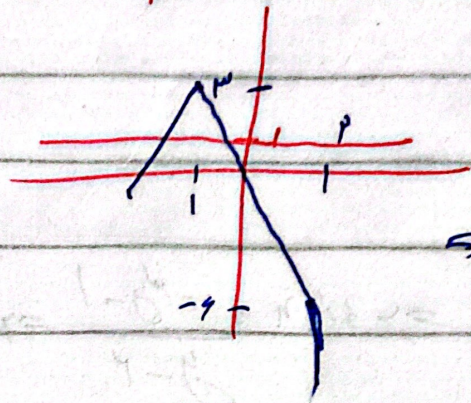
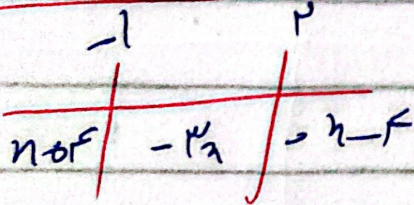
$$\Rightarrow Df = [1, \infty)$$



ب) گمانی $\Rightarrow$



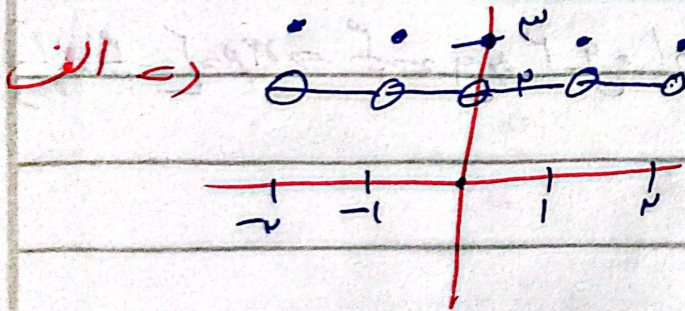
$\Rightarrow R_f = [f, +\infty)$



(2) (1)

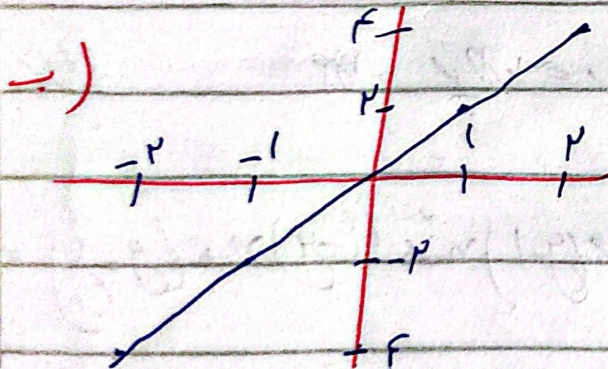
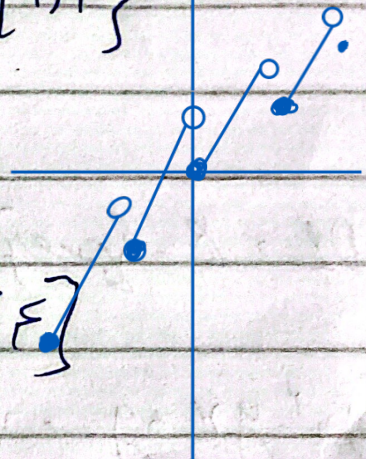
$\Rightarrow R_f = (-\infty, \frac{1}{f}]$

~~الف) الف~~



$\Rightarrow R_f = \{1, 3\}$

(1, 2, 5) (9)



$R_f = [-f, f]$

$R_f = (-\infty, 0)$

الف) $\sin^2 x - \sin x + 1$

(1) $\sin x = 1 \Rightarrow 1$

(2) $\sin x = 0 \Rightarrow 1$

(3) $\sin x = \frac{1}{2} \Rightarrow \frac{3}{4}$

$R_f = [\frac{3}{4}, 1]$

ب) $\sin^2 x - \sin^2 x + 1$

(1) $\sin^2 x = 1 \Rightarrow 1$

(2) $\sin^2 x = 0 \Rightarrow 1$

(3) $\sin^2 x = \frac{1}{4} \Rightarrow \frac{1}{4}$

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