

Subject : (

) General Solution

Date : _____

$$f(-n) - n f(n) = \sqrt{|n|} + 1 \xrightarrow{\times n} n f(-n) - n^2 f(n) = \sqrt{n|n|} + 1 \quad (1)$$

$$f(n) + n f(-n) = \sqrt{|-n|} + 1 \rightarrow n f(-n) + f(n) = \sqrt{|n|} + 1 \quad (2)$$

$$\boxed{f(n) = \frac{\sqrt{n|n|} - \sqrt{|n|}}{-n^2 - 1}} \quad \leftarrow \quad (-n^2 - 1) f(n) = \sqrt{n|n|} + 1 - \sqrt{|n|} - 1$$

$$f(n) + f(0) = n^2 - n + 4 \quad f(0) + f(0) = 4 \rightarrow f(0) = 2 \quad (3)$$

$$\Rightarrow f(n) = n^2 - n + 2 \rightarrow f(n^2) = n^4 - n^2 + 2$$

$$y = \frac{n^2 + n + 2}{n - 1} \rightarrow ny - y = n^2 + n + 2 \rightarrow n^2 + (1 - y)n + 2 + y = 0 \quad (4)$$

$$n = \frac{y - 1 \pm \sqrt{y^2 - 4y + 1 - 4y - 4}}{1} \rightarrow y^2 - 4y - 3 \geq 0 \rightarrow (y - 7)(y + 1) \geq 0$$

$$\frac{-1}{+} \quad \frac{7}{-} \quad \Rightarrow R_f = (-\infty, -1] \cup [7, +\infty)$$

$$(الف) y = \sqrt{n^2 - 4n + 1} \quad \min \left| \frac{dy}{dn} \right| \Rightarrow R = \left[-\frac{1}{4}, +\infty \right)$$

$$\left| \frac{2n - 4}{2\sqrt{n^2 - 4n + 1}} \right| = \frac{1}{4} \Rightarrow 2n - 4 = \pm \sqrt{n^2 - 4n + 1}$$

$$(ب) y = \sqrt{-n^2 + 4n - 5} \quad \max \left| \frac{dy}{dn} \right| = \frac{4}{2\sqrt{-n^2 + 4n - 5}} = 2 \Rightarrow R = [0, 2]$$

$$-2n + 4 = \pm \sqrt{-n^2 + 4n - 5}$$

$$(ج) y = \sqrt{n^2 - 4n + 1} \rightarrow R = [0, +\infty)$$

Arman

$$1) y = \log(n^p u_n^p + v_n + c) \rightarrow D = \mathbb{R}$$

$$\text{الف) } y = \frac{u_{n+1}}{u_{n-1}} \rightarrow D = \mathbb{R} - \left\{ \frac{p}{r} \right\} \quad -d$$

$$ب) y = \sqrt{\frac{u_{n+1}}{n-p}} \rightarrow D = [0, +\infty) - \left\{ \frac{p}{r} \right\}$$

$$ج) y = \frac{u_n^p + c}{\sqrt{u_n^p + p}} = \sqrt{u_n^p + p} + \frac{1}{\sqrt{u_n^p + p}} \rightarrow D = \left[\frac{p}{r}, +\infty \right)$$

$$د) y = u_n^p + c + \frac{1}{u_n^p + c} - c \Rightarrow D = \left[\frac{1}{r}, +\infty \right)$$

$$y = \frac{u_n^p + c}{u_n^p - 1} \quad \begin{cases} n=0 \rightarrow y = -c \\ n \rightarrow \infty \rightarrow y \rightarrow \infty \end{cases} \quad D = (-\infty, -c] \cup (p, +\infty) \quad -4$$

$$y = \frac{p \sin n + c}{\sin n - p} \quad \begin{cases} \sin n = 1 \rightarrow -p \\ \sin n = -1 \rightarrow -\frac{1}{p} \end{cases} \Rightarrow D_f = \left[-p, -\frac{1}{p} \right] \quad -v$$

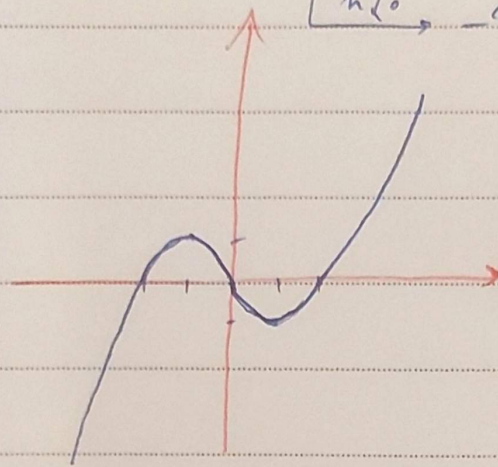
$$\text{الف) } y = \left| \frac{u_{n+1}}{u_n} \right| \Rightarrow D = [0, +\infty) - \left\{ \frac{p}{r} \right\} \quad -1$$

$$ب) y = \sqrt{\frac{q_n - 1}{r_n - 1}} = \sqrt{\frac{q(n-p)}{r(n-p)}} = \frac{p}{r} \rightarrow D = \left\{ \frac{p}{r} \right\}$$

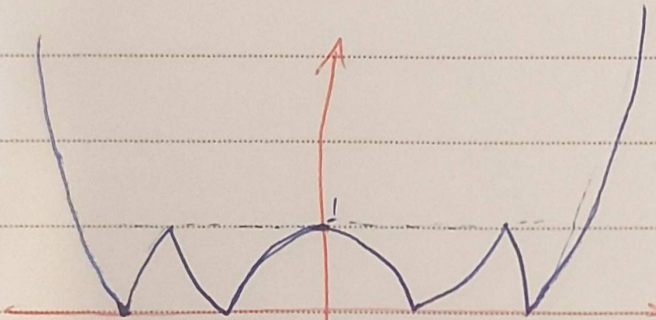
— Arman —

$$y = n/n - P_m \quad \begin{cases} n < 0 & n^2 - P_m = n(n-r) \\ n > 0 & -n^2 - P_m = -n(n+r) \end{cases}$$

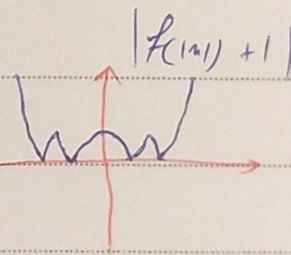
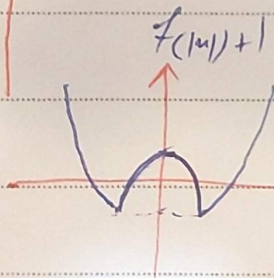
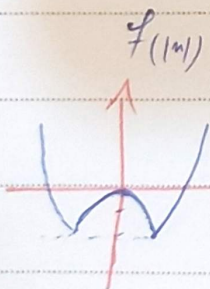
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$$\Rightarrow R_f = \mathbb{R}$$



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