

$$f(n) - (-n) f(-n) = 2|n| + 1$$

جس میں $n, -n$ کی جگہ

$$(-n) = |n|$$

$$f(-n) - n f(n) = 2|n| + 1$$

$$f(n) - n f(-n) = 2|n| + 1$$

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

زیادہ

$$f(-n) = n f(n) + 2|n| + 1 \Rightarrow f(n) + n[n f(n) + 2|n| + 1] = 2|n| + 1$$

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

$$f(n) + f(0) = n^2 - 2n + 2$$

۲ - ۲

$$n=0 \Rightarrow 2f(0) = 2 \Rightarrow f(0) = 1 \Rightarrow f(n) = n^2 - 2n + 2 = n^2 - 2n + 2$$

$$f(n^2) = n^4 - 2n^2 + 2$$

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

۲ - ۳

$$y(n-1) = n^2 + n + 2 \Rightarrow n^2 + (1-y)n + y + 2 = 0$$

$$(1-y)^2 - 4(y+2) \geq 0 \Rightarrow 1 - 2y + y^2 - 4y - 8 \geq 0 \Rightarrow$$

$$y^2 - 6y - 7 \geq 0 \Rightarrow (y-7)(y+1) \geq 0$$

$$R_f = (-\infty, -1] \cup [7, +\infty)$$

$$\text{الف) } n = \frac{-b}{2a} = \frac{5}{2} \quad y = 2\left(\frac{5}{2}\right)^2 - 5\left(\frac{5}{2}\right) + 1 = \frac{-17}{2}$$

$$R_f = \left[-\frac{17}{2}, +\infty\right)$$

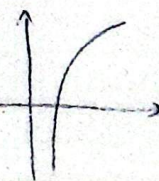
$$\text{ب) } n = \frac{-b}{2a} = \frac{-2}{-1} = 2 \quad y = 4$$

$$R_f = [0, 2]$$

$$\text{ج) } y \geq 0 \rightarrow R_f = [0, +\infty)$$

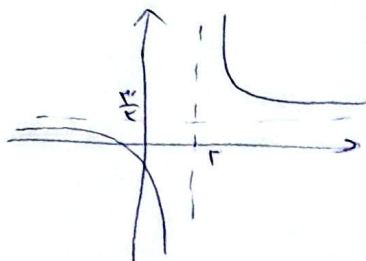
اس معادلہ حد تک کے جواب حقیقی دائرہ کہ معادلات میں صفر ہم جز بردہ

۲) عبارات داخل لکڑ کے مع درجہ ۳ باضرب + اس
رد عبارت داخل لکڑ اندر حقیقی اس
د عبارت داخل لکڑ
۳) $y = 1$ و $y = 0$
عبارت داخل لکڑ
۴) $m > 0$



$$R_f = \mathbb{R}$$

الف) $y = \frac{r+1}{r-1}$
 $u = r$
 $y = \frac{r}{r}$



$R_f = (R, \frac{r}{r})$

(۲)

ب) $y = \sqrt{\frac{r+1}{r-1}} \Rightarrow y \geq 0 \Rightarrow y^2 = \frac{r+1}{r-1} \Rightarrow y^2(r-1) = r+1$
 $\Rightarrow r(y^2-1) = r+1 \Rightarrow r = \frac{r+1}{y^2-1} \Rightarrow y \geq 0$

ج) $y = \frac{u^2+1}{\sqrt{u^2+3}}$
 $y^2-1 \neq 0 \Rightarrow y \neq \pm 1 \Rightarrow R_f = [\frac{r}{r}, \frac{r}{r}) \cup (\frac{r}{r}, +\infty)$

$\sqrt{u^2+3} \geq r \rightarrow \sqrt{u^2+3} \geq \sqrt{3} \Rightarrow a = \sqrt{u^2+3} \Rightarrow y = u + \frac{1}{a}$

د) $y = u^2 + \frac{1}{u^2+1}$
 $u^2 \geq 0 \Rightarrow t = u^2 \Rightarrow t \geq 0 \Rightarrow y = t + \frac{1}{t+1}$
 $f'(t) = 1 - \frac{1}{(t+1)^2} > 0 \Rightarrow t = 0 \Rightarrow y_{min} = \frac{1}{1}$
 $t \rightarrow +\infty \Rightarrow y \rightarrow +\infty$
 $R_f = [\frac{1}{1}, +\infty)$

$y = \frac{r+1}{r-1}$

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روش اول (۲)

$y(u^2-1) = r+1 \Rightarrow yu^2 - y = r+1 \Rightarrow (y-r)u^2 = y+r$

$\Rightarrow u^2 = \frac{y+r}{y-r} \Rightarrow \frac{y+r}{y-r} \geq 0 \Rightarrow \frac{-r}{r} \leq \frac{r}{r}$

$R_f = (-\infty, -r] \cup (r, +\infty)$

$\frac{r(0)+1}{0-1} = -1$

روش دیگر: سرد به ازاداد

$\frac{r(+\infty)+1}{(+\infty)-1} = 1$

$R_f = (-\infty, -1] \cup (1, +\infty)$

Sin u مع دقت ۳ من سوزد
 خروج صفر من سوزد

$-1 \leq \sin u \leq 1$

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(۲)

$\sin u = 0 \Rightarrow \frac{r(0)+1}{0-1} = -1$

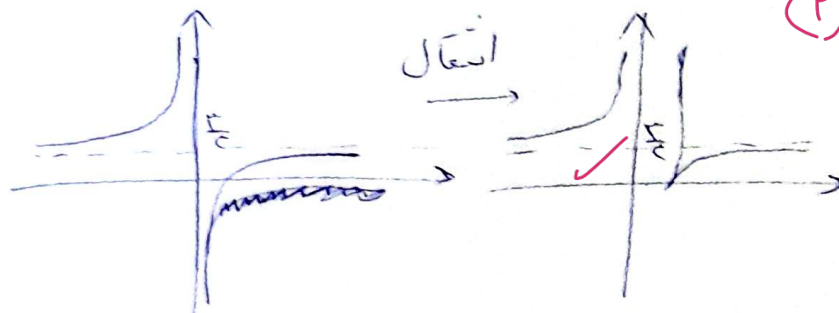
$\sin u = 1 \Rightarrow \frac{r+1}{r-1} = \frac{r}{r} \Rightarrow r_{min}$

$\sin u = -1 \Rightarrow \frac{-r+1}{-r-1} = -1 \Rightarrow r_{max}$

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

الف) $y = \left| \frac{\varepsilon n - 1}{\varepsilon n} \right|$

$R_f = [\varepsilon, +\infty)$



ب) $y = \sqrt{\frac{\varepsilon n - 1}{-\varepsilon n - 1}} \Rightarrow \frac{\varepsilon n - 1}{\varepsilon n - 1} \geq 0 \Rightarrow \frac{\varepsilon(n-1)}{\varepsilon(n-1)} \geq 0$

$n \neq 1, \frac{\varepsilon}{\varepsilon} \geq 0 \Rightarrow y = \sqrt{\frac{\varepsilon}{\varepsilon}} = \frac{\varepsilon}{\varepsilon} \Rightarrow R_f = \left\{ \frac{\varepsilon}{\varepsilon} \right\}$

$y = \min |1 - 2n|$

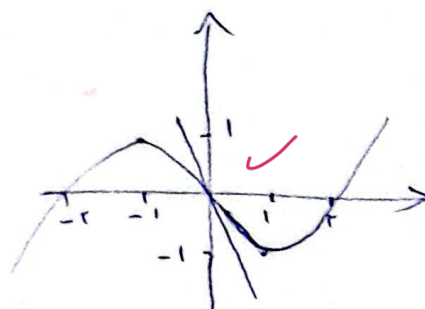
$n \geq 0, n^2 - 2n$

$n = \frac{\varepsilon}{\varepsilon} = 1$
 $y = -1$

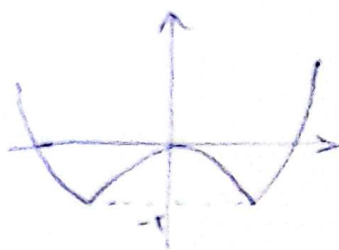
$n < 0, -n^2 - 2n$

$n = \frac{\varepsilon}{\varepsilon} = -1$
 $y = 1$

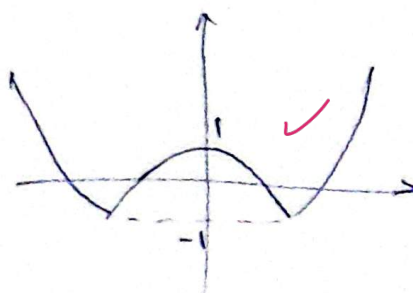
$R_f = \mathbb{R}$



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



$f(n) = f(n)$
سبب تکرار
سبب تکرار



تکلی های انتقال یافته

