

$$f(-n) - af(n) = 2|n| + 1 \quad / \quad a \rightarrow -a \rightarrow f(-(-n)) + af(n) = 2|n| + 1$$

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

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

$$x \rightarrow -x \rightarrow -af(-n) - n^2 f(n) = 2|n| + 1$$

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

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

$$f(n) = \begin{cases} \frac{2|n| + 1}{a+1} & a > 0 \\ \frac{2|n| + 1}{1-a} & a < 0 \end{cases}$$

$$f(n) + f(0) = a^2 - 2an + 4 \quad / \quad a \rightarrow 0 \rightarrow 2f(0) = 4 \rightarrow f(0) = 2$$

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

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

$$y = \frac{a^2 + a + 1}{a-1} \rightarrow ay - y = a^2 + a + 1 \rightarrow a^2 + a(1-y) + 1 = 0$$

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

$$(y-3)(y+1) \geq 0 \quad \frac{-1}{+} \frac{3}{-}$$

$$R_f = \mathbb{R} - (-1, 3)$$

$$\text{الف) } y = \frac{a^2 - 2an + 1}{a+1} \rightarrow \min \rightarrow a > 0$$

$$a_s = -\frac{b}{2a} = \frac{0}{2} = 0 \rightarrow y_s = \frac{1}{1}$$

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

$$\text{ب) } y = \sqrt{a^2 - 2an + 1} \rightarrow \text{توان فرد}$$

$$(-\infty, +\infty) = (-1, +\infty)$$

$$\text{ج) } y = \frac{a^2 + 1}{a-1} \rightarrow \text{مشتق}$$

$$R = \left[\frac{1}{2}, +\infty \right)$$

$$\frac{a}{c} = \frac{1}{2} \rightarrow R_f = A - \left[\frac{1}{2}, +\infty \right)$$

$$\text{د) } y = \frac{a^2 + 1}{\sqrt{a^2 + 1}} = \sqrt{a^2 + 1}$$

$$a \rightarrow 0 \rightarrow \sqrt{1} = 1 \quad R_f = \left[\frac{1}{2}, +\infty \right)$$

$$\text{الف) } y = \sqrt{-a^2 + 4a - 5}$$

$$a_s = 2, y_s = 3$$

$$\sqrt{(-\infty, 1]} = [0, 3] \rightarrow R_f$$

$$\text{ب) } \log(a^2 - 4a^2 - 4a + 2)$$

$$(-\infty, +\infty) \rightarrow R_f = \mathbb{R}$$

$$\text{ج) } y = \sqrt{\frac{a^2 + 1}{a-1}} \rightarrow A - \frac{a}{2} = A - \left[\frac{1}{2}, +\infty \right)$$

$$\sqrt{A - \left[\frac{1}{2}, +\infty \right)} = (0, +\infty) = \left[\frac{1}{2}, +\infty \right) \rightarrow R_f$$

$$\text{د) } y = a^2 + \frac{1}{a^2 + 1} \pm \frac{1}{a^2 + 1}$$

$$a \rightarrow 0 \rightarrow 1 + \frac{1}{1} = 2 \rightarrow R_f = \left[\frac{1}{2}, +\infty \right)$$

$$y = \frac{r^2 + 1}{r^2 - 1} \rightarrow \text{مخرج} = y r^2 - y + r^2 + 1 \rightarrow (r^2 - y) + y r^2 + 1 = 0 \quad (1)$$

$$R_f \cdot R - \left(\frac{r^2}{r^2 - 1} \right) + \frac{r^2}{r^2 - 1} = \frac{r^2 - y}{r^2 - y} \geq 0$$

$$y = \frac{r^2 + 1}{r^2 - 1} \rightarrow \text{مخرج} = r^2 + \infty \rightarrow \frac{r^2 + 1}{r^2 - 1} = r$$

$$r^2 = 0 \rightarrow \frac{1}{-1} = -1 \rightarrow \text{مخرج صفر می شود}$$

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

$$f(m) = \frac{r \sin m + 1}{\sin m - r} \rightarrow \sin m = 1 \rightarrow \frac{r + 1}{1 - r} = -r$$

$$\sin m = -1 = \frac{-r + 1}{-1 - r} = -\frac{1}{r}$$

$$\sin m - r = 0 \rightarrow \sin m = r \rightarrow \text{مخرج صفر می شود}$$

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

$$\text{الف) } y = \left| \frac{r m - 1}{r m} \right| \rightarrow \left| R - \left(\frac{r}{r} \right) \right|$$

$$= \left(0, +\infty \right) \left(\frac{r}{r} \right) = R_f$$

صفر بعد ...

$$\rightarrow y = \sqrt{\frac{9m - 11}{-1 + 11m}} \cdot \frac{4(m - 1)}{r(m - 1)}$$

$$\sqrt{\frac{9}{11}} = \frac{r}{r}$$

$$R_y = \left\{ \frac{r}{r} \right\}$$

$$y = m |r| - r m \rightarrow \begin{cases} m \geq 0 \rightarrow m^2 - r m \\ m < 0 \rightarrow -m^2 - r m \end{cases}$$



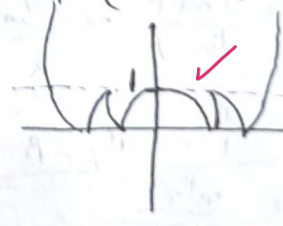
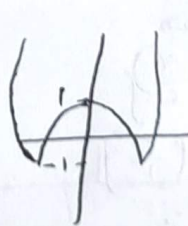
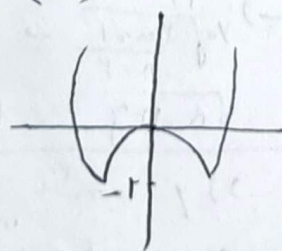
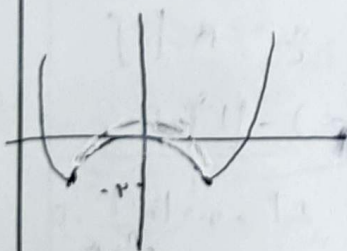
$$R_f = \mathbb{R}$$

$$f(m)$$

$$f(lm)$$

$$f(m) + 1$$

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



۸- اول برد عبارت داخل قدر مطلق

رو حساب می کنیم بعد قدر مطلق می گیریم

فقط حواسه باشه که $y = \frac{3}{4}$ هم هست داخل برد

$y = -\frac{3}{4}$ عضو برد عبارت داخل قدر مطلق هست و وقتی قدر مطلق بگیریم $y = \frac{3}{4}$

رو صید بهموت

$$R_y = |R - \{\frac{3}{4}\}| = [0 + \infty)$$

