

$$\begin{aligned} f(-n) - n f(n) &= f(n) + n f(-n) \Rightarrow n = \frac{f(-n) - f(n)}{f(n) + f(n)} \Rightarrow \frac{n-1}{2} = \frac{-2f(n)}{2f(n)+2f(n)} \\ \Rightarrow \frac{1-n}{n+1} &= \frac{f(n)}{f(-n)} \Rightarrow f(-n) = f(n) \frac{n+1}{1-n} \Rightarrow \left\{ \begin{array}{l} n > 0 \rightarrow f(n) \frac{n+1}{1-n} = 2n+1 - n f(n) \\ n < 0 \rightarrow f(n) \frac{n+1}{1-n} = -2n+1 - n f(n) \end{array} \right. \\ \Rightarrow f(n) &= \frac{2n^2 - 2n + 1}{n^2 - 2n + 1} \quad \text{جواب} \end{aligned}$$

$$\begin{aligned} n=0 &\Rightarrow 2f(0)=6 \Rightarrow f(0)=3 \Rightarrow f(n) = n^2 - 2n + 3 \\ \Rightarrow f(n^2) &= n^4 - 2n^2 + 3 \end{aligned}$$

2

$$\begin{aligned} yn-y &= n^2+n+2 \Rightarrow n^2+(1-y)n+y+2=0 \Rightarrow n = \frac{y-1 \pm \sqrt{(1-y)^2 - 4(y+2)}}{2} \\ \Rightarrow (y-1)^2 - 4(y+2) &\geq 0 \Rightarrow y^2 - 2y + 1 - 4y - 8 \geq 0 \Rightarrow y^2 - 6y - 7 \geq 0 \\ \frac{-1}{+} \quad \frac{7}{-} &\Rightarrow R_f = R - (-1, 7) \end{aligned}$$

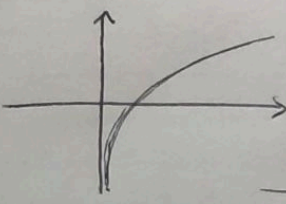
3

$$\begin{aligned} \text{الف)} \quad \xrightarrow{\min \text{ دار}} \quad n_{\min} &= \frac{-b}{2a} = \frac{5}{2} \Rightarrow y_{\min} = 2\left(\frac{5}{2}\right)^2 - 5\left(\frac{5}{2}\right) + 1 = -\frac{17}{2} \\ \Rightarrow R_f &= \left[-\frac{17}{2}, +\infty\right) \end{aligned}$$

$$\begin{aligned} \text{ب)} \quad \xrightarrow{\text{داخل رادیکال}} \quad n_{\max} &= \frac{-6}{-2} = 3 \Rightarrow y_{\max} = 2 \Rightarrow R_f = [0, 2] \end{aligned}$$

4

$$\text{ج)} \quad \xrightarrow{\text{زیر رادیکال بردش } R \text{ هست}} \quad R_f = [0, +\infty)$$

د)  شکل یک لیبی
آرینه بگیرد
 $R_f = R$ چون عبارت تحت رادیکال همیشه مثبت است، پس عضو یک تمام دایره ای را که میخواهد دارد و بنابراین برد تابع با برد خود $\mathbb{R}$ یک برابر است

$$\text{الف)} \quad n = \frac{6y+4}{2y-3} \Rightarrow R_f = R - \left\{\frac{3}{2}\right\}$$

$$\text{ب)} \quad \xrightarrow{\text{داخل رادیکال}} \quad \frac{6n+1}{n-2} \xrightarrow{\text{بردار}} R - \{2\} \Rightarrow R_f = [0, +\infty) - \{2\}$$

$$\text{ج)} \quad \frac{n^2+4}{\sqrt{n^2+3}} = \sqrt{n^2+3} + \frac{1}{\sqrt{n^2+3}} \quad n=0 \Rightarrow y = \frac{4}{\sqrt{3}} \Rightarrow R_f = \left[\frac{4}{\sqrt{3}}, +\infty\right)$$

$$\text{د)} \quad n^2+4 + \frac{1}{n^2+4} - 4 \xrightarrow{n=0} y = \frac{1}{4} \Rightarrow R_f = \left[\frac{1}{4}, +\infty\right)$$

5

$$y n^2 - y = n^2 + \varepsilon \Rightarrow (n-y)n^2 + y + \varepsilon = 0 \Rightarrow n = \pm \sqrt{-\frac{y+\varepsilon}{n-y}}$$

$$\Rightarrow \frac{y+\varepsilon}{n-y} \leq 0 \Rightarrow \frac{-\varepsilon}{-1+\frac{1}{n}} \Rightarrow R_f = R - (-\varepsilon, 3]$$

$$y n^2 = 0 \Rightarrow y = -\varepsilon$$

$$y n^2 = \infty \Rightarrow y = 3 \Rightarrow R_f = (-\infty, -\varepsilon] \cup (3, +\infty)$$

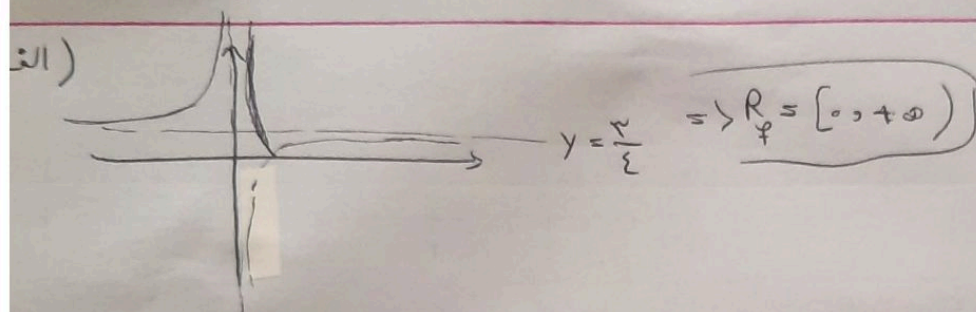
چون از حد بدست می آید، باز است.

* نمی تواند صفر شود پس خارج بازه است.

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

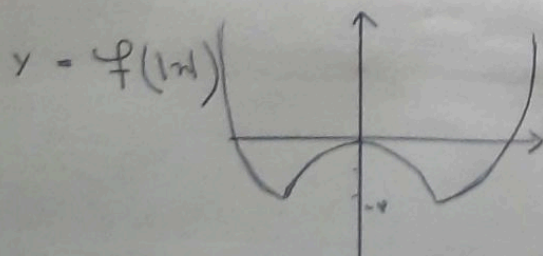
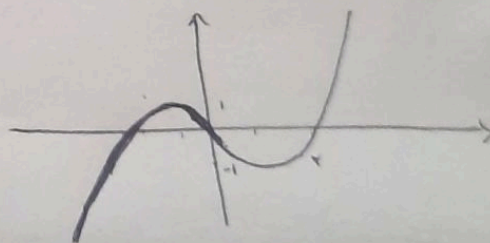
$$\sin n = 1 \Rightarrow y = -n \Rightarrow R_f = [-n, -\frac{1}{n}]$$

* نمی توانی صفر شود

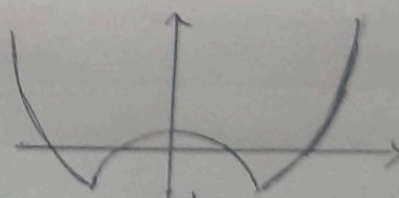


$$y = \sqrt{\frac{9}{\varepsilon} \times \left(\frac{n-2}{n-2}\right)} = 1/2 \Rightarrow R_f = \left\{\frac{n}{2}\right\}$$

$$y = n(|n| - 2) \begin{cases} n > 0 \Rightarrow y = n^2 - 2n \\ n < 0 \Rightarrow y = -n^2 - 2n \end{cases} \Rightarrow R_f = \mathbb{R}$$



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



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

