

$$f(n) - (1-n)f(n) = 2|n| + 1 \xrightarrow{|n| \geq |1-n|} f(n) + n f(n) = 2|n| + 1$$

$$f(-n) - 6n f(n) = 4|n| + 1 \rightarrow f(-n) = 4n f(n) + 2|n| + 1$$

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

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

$$f(n) + f(n) = n^2 - 2n + 4 \rightarrow 2f(n) = n^2 - 2n + 4 \rightarrow f(n) = \frac{n^2 - 2n + 4}{2}$$

$$f(n) + 3 = n^2 - 2n + 4 \rightarrow f(n) = n^2 - 2n + 1 \rightarrow f(n^2) = n^4 - 2n^2 + 1$$

$$y = \frac{n^2 + n + 2}{n-1} = 2n - 2 = n^2 + n + 2 \rightarrow n^2 + n - 2n + 2 + y = 0$$

$$n^2 + (1-y)n + 2+y = 0 \quad (1-y)^2 - 4(1)(2+y) \geq 0 \quad y^2 - 4y - 7 \geq 0$$

$$(y-7)(y+1) \geq 0 \quad y \leq -1 \text{ or } y \geq 7 \quad \mathbb{R} = (-\infty, -1] \cup [7, \infty)$$

$$1) \quad x^2 - 6x + 1 = 2 \quad \frac{-b}{a} = \frac{0}{1} = 0$$

$$0 \rightarrow \frac{x^2}{1} - \frac{6x}{1} + \frac{1}{1} = -\frac{1x}{1} \quad \mathbb{R} = [-\frac{1x}{1}, \infty)$$

$$\rightarrow -9 + 18 - 0 = 9 \quad \sqrt{(-6)^2 - 4(1)(-1)} = [0, 2]$$

$$2) \quad \sqrt{n^2 - 2n^2 + 1} \rightarrow \sqrt{1} = [0, \infty)$$

$$1.2 \quad \frac{n^2}{1} - 2 \frac{n^2}{1} + \frac{1}{1} \leq 1.2 \quad \mathbb{R} \rightarrow 1.2 \quad \mathbb{R}$$

$$\mathbb{R} = \mathbb{R}$$

$$1) \quad y = \frac{2n+1}{2n-1} \rightarrow n = \frac{y+1}{y-2}$$

$$\mathbb{R} = \mathbb{R} - \left\{ \frac{2}{1} \right\}$$

$$\sqrt{\frac{y+1}{y-2}} \quad n = -\frac{-y-1}{y-2} \rightarrow n = \frac{y+1}{y-2}$$

$$\mathbb{R} = \mathbb{R} - \{2\} \quad \sqrt{\mathbb{R} - \{2\}} = [0, 2) \cup (2, \infty)$$

$$2) \quad \frac{n^2 + 1}{\sqrt{n^2 + 1}} = t \quad \frac{t^2 + 1}{t} = t + \frac{1}{t} \quad ①$$

$$\frac{t^2 + 1}{\sqrt{t^2 + 1}} \geq \sqrt{t^2 + 1} \quad ②$$

$$(2, 2) \rightarrow \sqrt{2} + \frac{1}{\sqrt{2}} = \frac{2\sqrt{2}}{\sqrt{2}} \quad \mathbb{R} = \left[\frac{2\sqrt{2}}{\sqrt{2}}, \infty \right)$$

$$2) \quad y = n^2 + \frac{1}{n^2 + 1} \xrightarrow{t \geq 1} y = t + \frac{1}{t} - 1 \quad ②$$

$$(2, 2) \rightarrow t + \frac{1}{t} - 1 = \frac{1}{t} \quad \mathbb{R} = \left[\frac{1}{t}, \infty \right)$$

$$z = \frac{r \cos^2 \theta + r}{\cos^2 \theta - 1} = z \cos^2 \theta - z = r \cos^2 \theta + r \rightarrow z \cos^2 \theta - r \cos^2 \theta = z + r$$

$$r^2(z - r) = z + r \rightarrow r^2 = \frac{z + r}{z - r} \quad -\frac{r}{z} - \frac{r}{z} + R = (-\infty, -r] \cup (r, \infty)$$

$$z = \frac{r \cos^2 \theta + r}{\cos^2 \theta - 1} \rightarrow r^2 = -\frac{z + r}{z - r} = \frac{z + r}{z - r} = r^2 \rightarrow R = (-\infty, -r] \cup (r, \infty)$$

$$z = \frac{r \sin(\omega) + r}{\sin(\omega) - r} \xrightarrow{\sin(\omega) = t} \frac{r t + r}{t - r} \Rightarrow \frac{r(t - r) + 1}{t - r}$$

$$\frac{r(t - r)}{t - r} + \frac{1}{t - r} = r + \frac{1}{t - r} \quad -1 \leq t \leq 1 \Rightarrow -r \leq t - r \leq -r -$$

$$-\frac{1}{r} \leq \frac{1}{t - r} \leq -\frac{1}{r} \rightarrow -\infty \leq \frac{1}{t - r} \leq -\frac{\infty}{r} \rightarrow -r \leq r + \frac{1}{t - r} \leq -\frac{1}{r} \quad R = [-r, -\frac{1}{r}]$$

$$2) z = \left| \frac{r \cos \theta - 1}{\cos \theta} \right| \rightarrow z = \frac{r \cos \theta - 1}{\cos \theta + 0} \Rightarrow -\frac{1}{r \cos \theta} \Rightarrow n \leq \frac{-1}{r \cos \theta} \quad \frac{r}{r} + \frac{r}{r} -$$

$$R \subset \mathbb{R} - \left\{ \frac{r}{r} \right\} \Rightarrow \left| \mathbb{R} - \left\{ \frac{r}{r} \right\} \right| = [0, \infty)$$

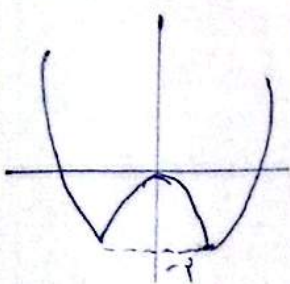
$$3) \sqrt{\frac{q \cos \theta - 1}{-1 + r \cos \theta}} = \sqrt{\frac{q(n - r)}{f(n - r)}} = \sqrt{\frac{q}{f}} = \sqrt{\frac{r}{r}} \rightarrow R = \frac{r}{r}$$

$$z = n|n| - r \cos \theta \xrightarrow{n \geq 0} n^2 - r \cos \theta \neq z \quad -\frac{b}{r \cos \theta} = \frac{r}{r} \leq 1 \rightarrow 1 - r(1) = -1$$

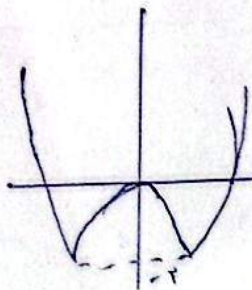
$$R = [-1, \infty) \xrightarrow{n < 0} -n^2 - r \cos \theta = 0 \quad -\frac{b}{r \cos \theta} = \frac{r}{-r} = -1$$

$$-1 \rightarrow -1 + r = 1 \rightarrow R = (-\infty, 1]$$

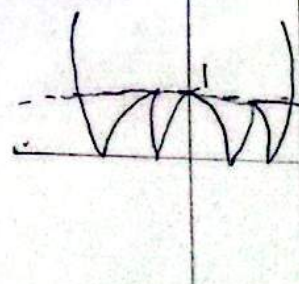
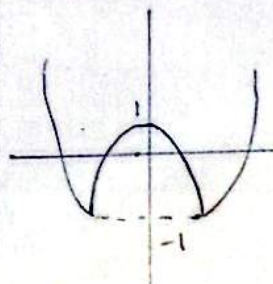
$$R = [-1, \infty) \cup (-\infty, 1] = \mathbb{R}$$



$f(x)$



$f(1/x)$



1.