

۲۰. حل فوب فوبی:

$f(n) - (1-n)f(n) = 2 n + 1 \rightarrow f(n) + n f(n) = 2 n + 1$ $f(n) - n f(n) = 2 n + 1 \rightarrow f(n) = n f(n) + 2 n + 1$ $f(n) + n^2 f(n) + n + 2n n = 2 n + 1 \rightarrow (1+n^2)f(n) = 2 n (1-n) + (1-n)$ $f(n) = \frac{(1-n)(2 n + 1)}{1+n^2}$	۱
$f(n) + f(n) = n^2 - 2n + 4 \rightarrow 2f(n) = n^2 - 2n + 4 \rightarrow f(n) = \frac{n^2 - 2n + 4}{2}$ $f(n) + 3 = n^2 - 2n + 4 \rightarrow f(n) = n^2 - 2n + 1 \rightarrow f(n) = n^2 - 2n + 1$	۲
$2 = \frac{n^2 + n + 2}{n-1} = 2n - 2 = n^2 + n + 2 \rightarrow n^2 + n - 2n + 2 + 2 = 0$ $n^2 + (1-2)n + 2+2 = 0 \quad (1-2)^2 - 4(1)(2+2) \geq 0 \quad 2^2 - 4 - 4 \geq 0$ $(2-4)(2+1) \geq 0 \quad -1 - 1 + 1 \quad IR = (-\infty, -1] \cup [1, \infty)$	۳
$1) \quad n^2 - 5n + 1 = 2 \quad \frac{-b}{a} = \frac{0}{1}$ $0 \rightarrow \frac{20}{1} = \frac{0}{1} + \frac{1}{1} = -\frac{19}{1} \quad R = [-\frac{19}{1}, \infty)$	۴
$2) \quad \sqrt{n^2 - 2n + 1} = 1 \rightarrow \sqrt{1} = 1$ $1 \rightarrow \frac{n^2}{2} - 2n + 1 \leq 1 \rightarrow \frac{n^2}{2} - 2n \leq 0 \rightarrow \frac{n^2}{2} \leq 2n \rightarrow n \leq 4$ $R = IR$	۵
$1) \quad 2 = \frac{2n+1}{n-1} \rightarrow n = \frac{2n+1}{2-1}$ $R = IR - \{1\}$	۶
$2) \quad \frac{n^2 + 1}{\sqrt{n^2 + 1}} = t \quad \frac{t^2 + 1}{t} = t + \frac{1}{t} \quad ①$ $2) \rightarrow \sqrt{2} + \frac{1}{\sqrt{2}} = \frac{2\sqrt{2}}{\sqrt{2}} \quad R = [\frac{2\sqrt{2}}{\sqrt{2}}, \infty)$	۷

$$z = \frac{r^n + r}{n^2 - 1} \Rightarrow z n^2 - z = r n^2 + r \Rightarrow z n^2 - r n^2 = z + r$$

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

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

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

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

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

$$z = \left| \frac{r n - 1}{n} \right| \Rightarrow z = \frac{r n - 1}{r n + 0} \Rightarrow -\frac{1}{r} \leq z \leq \frac{1}{r} \quad + \frac{r}{r} -$$

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

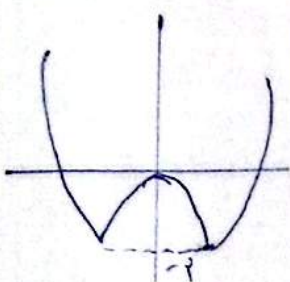
$$\sqrt{\frac{r n - 1}{r n + 0}} = \sqrt{\frac{r(n - r)}{r(n - r)}} = \sqrt{\frac{r}{r}} = \sqrt{\frac{r}{r}} \Rightarrow R = \frac{r}{r}$$

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

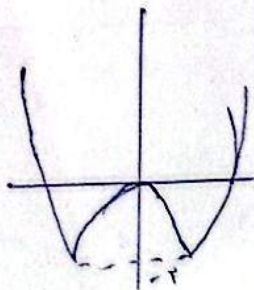
$$R = [-1, \infty) \xrightarrow{n < 0} -n^2 - r n = 0 \quad -\frac{b}{r a} = \frac{r}{-r} = -1$$

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

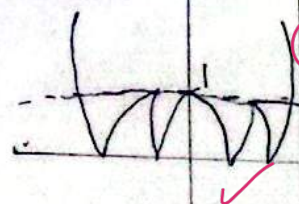
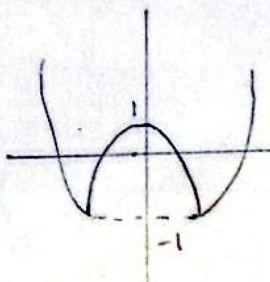
$$R = [-1, \infty) \cup (-\infty, 1] = \mathbb{R}$$



$f(x)$



$f(x)$



1.