

# 作業

武國寧

## 1 試作出下列函數的圖像

(1)  $y = \text{sgn}(\sin(x))$

(2)  $y = 1 - (x + 1)^2$

(3)  $y = \sin(x^2)$

## 2 解答題

函  $f(x) = \frac{1}{1+x}$ , 求  $f(2+x)$ ,  $f(2x)$ ,  $f(x^2)$ ,  $f(f(x))$ ,  $f(\frac{1}{f(x)})$

## 3 用區間表示下列不等式的解

(1)  $|1 - x| - x \geq 0$

(2)  $\left|x + \frac{1}{x}\right| \leq 6$

(3)  $\sin x \geq \frac{\sqrt{2}}{2}$

## 4 求下列數集的上下確界，並依據定義加以驗證

(1)  $S = \{x|x^2 < 2\}$

(2)  $S = \{x|x = n!, n \in \mathbb{N}\}$

(3)  $S = \{x|x \in (0, 1) \text{ and } x \text{ is irrational number}\}$

(4)  $S = \left\{x|x = 1 - \frac{1}{2^n}, n \in \mathbb{N}\right\}$