離散數學 107-2

Homework 02

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(week-8)

題目
   題目與注意事項

作答區
   解題

完成作業小時數

Homework 02 題目

(Prob. 1)	page 132, chapter 2.1 Exercises 36
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(Prob. 6)	page 194, chapter 2.6 Exercises 4

題目與注意事項

注意事項

(a) 要熟悉 LaTeX 請翻閱 lshort。

(b) 記得在最後一頁，回報完成作業小時數 (估算，取整數)。

(c) 將檔案夾命名為 hw02_107820xxx，將檔案夾壓縮成 hw02_107820xxx.zip，上傳到網路學園。

(d) LaTeX 數學符號請查此表: List of LaTeX mathematical symbols。

(e) 作業抄襲，以零分計。作業提供給他人抄襲，以零分計。

(f) 作業遲交一週內成績打五折，作業遲交超過一週以零分計。

Problem 1 (2.1 Exercises 36)

(a) $\{(a, a, a)\}$

(b) $\{(0, 0, 0), (0, 0, a), (0, a, 0), (0, a, a), (a, 0, 0), (a, 0, a), (a, a, 0), (a, a, a)\}$

Problem 2 (2.2 Exercises 4)

(a) $\{a, b, c, d, e, f, g, h\}$

(b) $\{a, b, c, d, e\}$

(c) $\{\}$

(d) $\{f, g, h\}$

Problem 3 (2.3 Exercises 38)

答:
Given: $g:R \to R$ and $f:R \to R$
$f(x) = x^2 + 1$
$g(x) = x + 2$
$\therefore f \circ g$ and $g \circ f$ are also from R to R
$(f \circ g)(x) = f(g(x)) = f(x+2) = (x+2)^2 + 1 = x^2 + 4x + 5$
$(g \circ f)(x) = g(f(x)) = g(x^2+1) = (x^2+1) + 2 = x^2 + 3$

Problem 4 (2.4 Exercises 34)

(a) $(1{-}1) + (1-2) + (2{-}1) + (2{-}2) + (3{-}1) + (3{-}2) = 3$

(b) $0 + 2 + 4 + 3 + 5 + 7 + 6 + 8 + 10 + 9 + 11 + 13 = 78$

(c) $0 + 1 + 2 + 0 + 1 + 2 + 0 + 1 + 2 = 9$

(d) $0 + 0 + 1 + 8 + 27 + 4 + 32 + 108 = 180$

Problem 5 (2.5 Exercises 6)

答:

∵ Hotel has a countable infinite number of rooms,we can number the positive integers $\mathbf{Z}^+ : 1, 2, 3, ...$

Given :the hotel closes all the even numbered rooms

$f : \mathbf{Z}^+ \to \mathbf{Z}^+, f(n) = 2n - 1$

∴ Move each guest from room n to room $2n - 1$

Problem 6 (2.6 Exercises 4)

(a)

$$\begin{bmatrix} 1 & 0 & 1 \\ 0 & -1 & -1 \\ -1 & 1 & 0 \end{bmatrix} \begin{bmatrix} 0 & 1 & -1 \\ 1 & -1 & 0 \\ -1 & 0 & 1 \end{bmatrix} = \begin{bmatrix} -1 & 1 & 0 \\ 0 & 1 & -1 \\ 1 & -2 & 1 \end{bmatrix}$$

(b)

$$\begin{bmatrix} 1 & -3 & 0 \\ 1 & 2 & 2 \\ 2 & 1 & -1 \end{bmatrix} \begin{bmatrix} 1 & -1 & 2 & 3 \\ -1 & 0 & 3 & -1 \\ -3 & -2 & 0 & 2 \end{bmatrix} = \begin{bmatrix} 4 & -1 & -7 & 6 \\ -7 & -5 & 8 & 5 \\ 4 & 0 & 7 & 3 \end{bmatrix}$$

(c)

$$\begin{bmatrix} 0 & -1 \\ 7 & 2 \\ -4 & -3 \end{bmatrix} \begin{bmatrix} 4 & -1 & 2 & 3 & 0 \\ -2 & 0 & 3 & 4 & 1 \end{bmatrix} = \begin{bmatrix} 2 & 0 & -3 & -4 & -1 \\ 24 & -7 & 20 & 29 & 2 \\ -10 & 4 & -17 & -24 & -3 \end{bmatrix}$$

完成作業小時數

完成作業小時數:共 3 小時(估算，取整數)