



題目

### 題目與注意事項

作答區

## 解題

完成作業小時數

# Homework 10 題目

- (Prob. 1) page 683, chapter 10.1 Exercise 2
- (Prob. 2) page 699, chapter 10.2 Exercise 8
- (Prob. 3) page 710, chapter 10.3 Exercise 8
- (Prob. 4) page 724, chapter 10.4 Exercise 2
- (Prob. 5) page 741, chapter 10.5 Exercise 54
- (Prob. 6) page 753, chapter 10.6 Exercise 26
- (Prob. 7) page 761, chapter 10.7 Exercise 14
- (Prob. 8) page 768, chapter 10.8 Exercise 6

# 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 hw10\_107820xxx，將檔案夾壓縮成 hw10\_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 (10.1 Exercise 2)

- (a) simple graph
- (b) multigraph
- (c) pseudograph

## Problem 2 (10.2 Exercise 8)

Ans: In this directed multigraph there are 4 vertices and 8 edges.

The degrees are:

$$\deg^-(a) = 2, \deg^+(a) = 2,$$

$$\deg^-(b) = 3, \deg^+(b) = 4,$$

$$\deg^-(c) = 2, \deg^+(c) = 1,$$

$$\deg^-(d) = 1, \deg^+(d) = 1,$$

### Problem 3 (10.3 Exercise 8)

$$\begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 1 \end{bmatrix}$$

## Problem 4 (10.4 Exercise 2)

- (a) This is (is, is not) a path of length 4, it is not (is, is not) a circuit, it is (is, is not) simple.
- (b) This is (is, is not) a path of length 4, it is (is, is not) a circuit, it is not (is, is not) simple.
- (c) This is not (is, is not) a path, since there is no edge from d to b.
- (d) This is not (is, is not) a path, since there is no edge from b to d.









## Problem 8 (10.8 Exercise 6)

Ans: Since there is a triangle in the graph, we will need at least 3 colors. Because vertex  $g$  is connected to all other vertices, so it needs to be assigned a unique color. Then we can assign one color to  $b, d$  and  $f$  and another to  $a, c$  and  $e$ .

## 完成作業小時數

完成作業小時數:共4小時(估算,取整數)