姓名: SOLUTION 葉均承 應數一線性代數

學號: _____ **Quiz 14** 考試日期: 2022/12/27

不可使用手機、計算器，禁止作弊!

1. Solve the given system of linear equations by Cramer's rule wherever it is possible.

$$\begin{cases} x_1 + x_2 = 1 \\ x_1 + 2x_2 = 2 \end{cases}$$

Answer: $x_1 = 0, x_2 = 1$

Solution：

Rewrite the problem as $A\vec{x} = \vec{b}$, where

$$A = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}, \ \vec{b} = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$$

Let

$$B_1 = \begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}, \ B_2 = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$$

$$x_1 = \frac{\det(B_1)}{\det(A)} = \frac{0}{1} = 0, \ x_2 = \frac{\det(B_2)}{\det(A)} = \frac{1}{1} = 1$$

2. Let A be an $n \times n$ matrix. Prove that

$$\det(adj(A)) = \det(A)^{n-1}$$

Solution：

請見 4-3 節，作業題 38 。