姓名:_____ 葉均承 應數三科學計算

學號: _____ **Quiz 10** 考試日期: 2021/05/18

1. 請框出答案. 2. 禁止作弊!

1. The nonlinear system

$$x_1^2 - 10x_1 + x_2^2 + 8 = 0,$$
$$x_1 x_2^2 + x_1 - 10x_2 + 8 = 0$$

can be transformed into the fixed-point problem

$$x_1 = g_1(x_1, x_2) = \frac{x_1^2 + x_2^2 + 8}{10},$$
$$x_2 = g_2(x_1, x_2) = \frac{x_1 x_2^2 + x_1 + 8}{10}$$

Use Theorem 10.6 to show that $\mathbf{G} = (g_1, g_2)^T$ mapping $\mathbf{D} \subset \mathbb{R}^2$ into $\mathbb{R}^2$ has a unique fixed point in

$$D = \{(x_1, x_2)t \mid 0 \leq x_1, x_2 \leq 1.5\}.$$