MTH101A: 2021 - 2022

Mock Exam: Question 2
Time: 6:30 - 7:00 pm

Q2. (a) Let $f : [0, 1] \to \mathbb{R}$ be a continuous function such that $f(x) = f(\sqrt{x})$ for all $x \in [0, 1]$. Show that f is constant.

[7 marks]

(b) Let $f : [0, 2] \to \mathbb{R}$ be continuous and $f(0) < f(2) < f(1)$. Show that there exist $x_0, x_1, x_2 \in [0, 2]$ such that $x_2 = 1 + x_1 - \frac{x_0}{2}$ and $f(x_2) = f(x_1)$.

[8 marks]