

**M353 1.2 fixed-point** (S. Zhang) .

1. (1.2:a1)  $g(x) = \frac{1}{2} + \frac{5}{8}x - \frac{x^2}{8}, \quad x \in [-1, 2]$

- (a) Do 2 fixed point iteration  $x = g(x)$  with  $x_0 = 0$ . What is the fixed point  $x = r$ ?
- (b) Show locally convergence.
- (c) Determine an upper bound for the number of iterations to reach  $10^{-4}$  accuracy for the fix point iteration for initial  $x_0 \in [-1, 2]$ .