

**MATH10282: INTRODUCTION TO STATISTICS**  
**SEMESTER 2**  
**SOLUTIONS TO QUIZ PROBLEM 1**

Consider the data  $x_1, x_2, \dots, x_n$  and the function

$$g(a) = \sum_{i=1}^n (x_i - a)^2.$$

The first derivative of  $g(a)$  is

$$\frac{dg(a)}{da} = -2 \sum_{i=1}^n (x_i - a) = -2 \left[ \left( \sum_{i=1}^n x_i \right) - na \right].$$

setting this to zero and solving for  $a$ , we obtain

$$a = \frac{1}{n} \sum_{i=1}^n x_i. \tag{1}$$

Since

$$\frac{d^2g(a)}{da^2} = 2n > 0,$$

the  $a$  in (1) minimizes  $g$ .