

Name \_\_\_\_\_

Student Number \_\_\_\_\_

### STA 431 Quiz 3

1. (5 points) Independently for  $i = 1, \dots, n$ , let  $y_i = \beta x_i + \epsilon_i$ , where  $x_i \sim N(\mu_x, \sigma_x^2)$ ,  $\epsilon_i \sim N(0, \sigma_\epsilon^2)$ , and  $x_i$  and  $\epsilon_i$  are independent. Let  $\hat{\beta}_n = \frac{\sum_{i=1}^n x_i y_i}{\sum_{i=1}^n x_i^2}$ . Is  $\hat{\beta}_n$  a consistent estimator of  $\beta$ ? Answer Yes or No and prove it.

2. (5 points) In Question 16 of this week's assignment, you estimated the parameters of the "mystery" distribution by maximum likelihood. In the space below, write the maximum likelihood estimate of  $\mu$ . The answer is a number from your printout. On your printout, circle the number and write "Question 2" beside it. **Do not answer this question if you do not have a printout.**

Please turn in your printout, showing your *complete* R input and output, with the quiz paper. Make sure your name and student number appear on the printout.