2. A marine biologist investigates the length of salmon in two regions, A and B.

A random sample of 60 salmon from region A gives the following summary statistics, where x cm is the length of each salmon.

$$\sum x = 4530 \qquad \sum x^2 = 350761$$

(a) Find unbiased estimates for the mean **and** variance of the length of salmon from region A.

(3)

A random sample of 80 salmon from region B gives the following results, where y cm is the length of each salmon.

$$\bar{y} = 82.3 \qquad s_y = 17.4$$

The biologist claims that the mean length of salmon in region B is more than 2 cm greater than the mean length of salmon in region A.

(b) Use a suitable test, at the 5% level of significance, to assess the biologist's claim. You should state your hypotheses, test statistic and critical value clearly.

(7)

(c) State an assumption you have made in carrying out the test in part (b).

(1)

(Total for Question 2 is 11 marks)