

Question 4

Uncle Albert Jones keeps chickens in his backyard. He regularly records the weights of the eggs that they lay and finds that the weights are normally distributed with a mean of 61 grams and a standard deviation of 8 grams.

- a. One afternoon Uncle Albert checks to find a freshly laid egg in the chicken coop.
 Calculate the probability, correct to four decimal places, that the egg weighs
- more than 67 grams

3

2 marks

- less than 59 grams

3

2 marks

- more than 67 grams, given that he knows it weighs more than 61 grams

4

2 marks

- b. The next morning, Albert finds 6 freshly laid eggs in the coop. Find the probability that at least two of these eggs weigh more than 67 grams.

4

4 marks

Uncle Albert's neighbour, Victor Cab, also keeps chickens which lay eggs whose weights are normally distributed with a variance of only 4 grams.

- c. Victor brags that 98% of his eggs weigh more than 67 grams. What would the mean weight of Victor's eggs be? Give your answer correct to one decimal place.

3

2 marks

Uncle Albert decides to sneak over to Victor's coop and see the results for himself. He finds that of the 12 eggs that Victor's chickens have laid that day, 7 of them weigh more than 67 grams.

- d. Uncle Albert uses this evidence to calculate a 95% confidence interval for the true value of the proportion of Victor's eggs weighing more than 67 grams. What answer should he get?

4

2 marks

- e. Uncle Albert reads in his favourite magazine, Australian Chookhouse, that 1 in 4 eggs laid throughout the world weigh more than 67 grams. Are Victor's eggs extraordinarily large? Explain.

1

1 mark

Total 15 marks

END OF TRIAL CAT 3