6. A random sample of 8 three-month-old golden retriever dogs is taken.

The heights of the golden retrievers are recorded.
Using this sample, a 95% confidence interval for the mean height, in cm, of three-month-old golden retrievers is found to be (45.72, 53.88)

(a) Find a 99% confidence interval for the mean height.
You may assume that the heights are normally distributed with known population standard deviation.

(5)

Some summary statistics for the weights, x kg, of this sample are given below.

$$\sum x = 91.2 \qquad \sum x^2 = 1145.16 \qquad n = 8$$

(b) Calculate unbiased estimates of the mean and the variance of the weights of three-month-old golden retrievers.

(3)

A further random sample of 24 three-month-old golden retrievers is taken.
The unbiased estimates of the mean and the variance of the weights, in kg, from this sample are found to be 10.8 and 17.64 respectively.

(c) Estimate the standard error of the mean weight for the combined sample of 32 three-month-old golden retrievers.

(7)

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Question 6 continued

(Total for Question 6 is 15 marks)