6 A garden centre sells bags of stones and large bags of gravel.

The weight, X kilograms, of stones in a bag can be modelled by a normal distribution with unknown mean μ and known standard deviation 0.4

The stones in each of a random sample of 36 bags from a large batch is weighed. The total weight of stones in these 36 bags is found to be 806.4 kg

(a) Find a 98% confidence interval for the mean weight of stones in the batch.

(4)

(b) Explain why the use of the Central Limit theorem is not required to answer part (a)

(1)

The manufacturer of these bags of stones claims that bags in this batch have a mean weight of 22.5 kg

(c) Using your answer to part (a), comment on the claim made by the manufacturer.

(2)

The weight, Y kilograms, of gravel in a large bag can be modelled by a normal distribution with mean 850 kg and standard deviation 5 kg

A builder purchases 10 large bags of gravel.

(d) Find the probability that the mean weight of gravel in the 10 large bags is less than 848 kg

(3)

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(Total for Question 6 is 10 marks)