5. The random variable X is normally distributed with unknown mean μ and known variance σ^2

A random sample of 36 observations of X resulted in a 90% confidence interval for μ of (24.7034, 26.8966)

(a) Find the mean of the sample.

(1)

(b) Show that the standard deviation of X is 4

(3)

The r% confidence interval using the 36 observations has a width of 1.6

(c) Calculate the value of r

(5)

A second independent sample of size n is taken from X

(d) Find the smallest value of n required to obtain a 90% confidence interval for μ of width at most 0.6

(3)

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Question 5 continued

(Total for Question 5 is 12 marks)