Nassa is researching the lengths of a particular type of snake in two countries, A and B.

(a) He takes a random sample of 10 snakes of this type from country A and measures the length, x m, of each snake. He then calculates a 90% confidence interval for the population mean length, μ m, for snakes of this type, assuming that snake lengths have a normal distribution. This confidence interval is $3.36 \leqslant \mu \leqslant 4.22$.

Find the sample mean and an unbiased estimate for the population variance. [4]

(b) Nassa also measures the lengths, y m, of a random sample of 8 snakes of this type taken from country B. His results are summarised as follows.

$$\Sigma y = 27.86 \qquad \Sigma y^2 = 98.02$$

Nassa claims that the mean length of snakes of this type in country B is less than the mean length of snakes of this type in country A. Nassa assumes that his sample from country B also comes from a normal distribution, with the same variance as the distribution from country A.

Test at the 10% significance level whether there is evidence to support Nassa's claim. [8]