

Seva is investigating the lengths of the tails of adult wallabies in two regions of Australia, X and Y . He chooses a random sample of 50 adult wallabies from region X and records the lengths, x cm, of their tails. He also chooses a random sample of 40 adult wallabies from region Y and records the lengths, y cm, of their tails. His results are summarised as follows.

$$\Sigma x = 1080 \quad \Sigma x^2 = 23\,480 \quad \Sigma y = 940 \quad \Sigma y^2 = 22\,220$$

It cannot be assumed that the population variances of the two distributions are the same.

- (a) Find a 90% confidence interval for the difference between the population mean lengths of the tails of adult wallabies in regions X and Y . [6]

The population mean lengths of the tails of adult wallabies in regions X and Y are μ_X cm and μ_Y cm respectively.

- (b) Test, at the 10% significance level, the null hypothesis $\mu_Y - \mu_X = 1.1$ against the alternative hypothesis $\mu_Y - \mu_X > 1.1$. State your conclusion in the context of the question. [4]