

A farmer grows two different types of cherries, Type  $A$  and Type  $B$ . He assumes that the masses of each type are normally distributed. He chooses a random sample of 8 cherries of Type  $A$ . He finds that the sample mean mass is 15.1 g and that a 95% confidence interval for the population mean mass,  $\mu$  g, is  $13.5 \leq \mu \leq 16.7$ .

- (i) Find an unbiased estimate for the population variance of the masses of cherries of Type  $A$ . [3]

The farmer now chooses a random sample of 6 cherries of Type  $B$  and records their masses as follows.

12.2      13.3      16.4      14.0      13.9      15.4

- (ii) Test at the 5% significance level whether the mean mass of cherries of Type  $B$  is less than the mean mass of cherries of Type  $A$ . You should assume that the population variances for the two types of cherry are equal. [9]