

Students at two colleges, A and B , are competing in a computer games challenge.

- (a) The time taken for a randomly chosen student from college A to complete the challenge has a normal distribution with mean μ minutes. The times taken, x minutes, are recorded for a random sample of 10 students chosen from college A . The results are summarised as follows.

$$\sum x = 828 \quad \sum x^2 = 68622$$

A test is carried out on the data at the 5% significance level and the result supports the claim that $\mu > k$.

Find the greatest possible value of k . [4]

- (b) A random sample of 8 students is chosen from college B . Their times to complete the same challenge give a sample mean of 79.8 minutes and an unbiased variance estimate of 9.966 minutes².

Use a 2-sample test at the 5% significance level to test whether the mean time for students at college B to complete the challenge is the same as the mean time for students at college A to complete the challenge. You should assume that the two distributions are normal and have the same population variance. [7]