2 A factory produces packets of biscuits. The total mass of biscuits in a packet has a normal distribution with mean μ. A random sample of 12 packets is taken and the mass of the contents of each packet, x g, is recorded. The results are summarised as follows.

$$\Sigma x = 2390 \qquad \Sigma x^2 = 476117$$

(a) Find a 99% confidence interval for μ. [4]

A test of the null hypothesis $\mu = k$ is carried out on this sample using a 5% significance level. The test does not support the alternative hypothesis $\mu < k$.

(b) Find the greatest possible value of k. [3]