A farmer grows large amounts of a certain crop. On average, the yield per plant has been $0.75 \,\mathrm{kg}$. The farmer has improved the soil in which the crop grows, and she claims that the yield per plant has increased. A random sample of 10 plants grown in the improved soil is chosen. The yields, $x \,\mathrm{kg}$, are summarised as follows.

$$\Sigma x = 7.85$$
 $\Sigma x^2 = 6.19$

- (i) Test at the 5% significance level whether the farmer's claim is justified, assuming a normal distribution. [7]
- (ii) Find a 95% confidence interval for the population mean yield for plants grown in the new soil.

[3]