During the summer months, all members of a large swimming club take part in intensive training. The times taken to swim 50 metres at the beginning of the summer and at the end of the summer are recorded for each member of the club. The time taken, in seconds, at the beginning of the summer is denoted by $x$ and the time taken at the end of the summer is denoted by $y$. For a random sample of 9 members the results are shown in the following table.

| Member | *A* | *B* | *C* | *D* | *E* | *F* | *G* | *H* | *I* |
|---|---|---|---|---|---|---|---|---|---|
| $x$ | 38.5 | 40.2 | 32.3 | 35.1 | 36.2 | 41.4 | 32.0 | 38.2 | 38.2 |
| $y$ | 37.4 | 38.1 | 31.6 | 34.7 | 34.2 | 38.6 | 31.8 | 36.3 | 36.8 |

The swimming coach believes that, on average, the time taken by a swimmer to swim 50 metres will decrease by more than one second as a result of the intensive training.

**(i)** Stating suitable hypotheses and assuming a normal distribution, test the coach's belief at the 10% significance level. [8]

**(ii)** Find a 95% confidence interval for the population mean time taken to swim 50 metres after the intensive training, assuming a normal distribution. [4]