Jade is a swimming instructor at a sports college. She claims that, as a result of an intensive training course, the mean time taken by students to swim 50 metres has reduced by more than 1 second. She chooses a random sample of 10 students. The times taken, in seconds, before and after the training course are recorded in the table.

Student	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*
Time before course	54.2	47.4	52.1	59.0	55.3	51.0	48.9	52.2	58.4	51.4
Time after course	50.1	46.3	52.5	58.8	51.4	48.4	49.5	48.7	58.3	51.4

(a) Test, at the 10% significance level, whether Jade's claim is justified. [7]

(b) State an assumption that is necessary for this test to be valid. [1]