

A sports college keeps records of the times taken by students to run one lap of a running track. The population median time taken is 51.0 seconds. After a month of intensive training, a random sample of 22 new students run one lap of the track, giving times, in seconds, as follows.

|      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|
| 51.3 | 52.0 | 53.4 | 49.2 | 49.3 | 51.1 | 52.2 | 47.2 |
| 53.0 | 48.5 | 49.4 | 50.3 | 50.8 | 51.6 | 49.1 | 52.3 |
| 51.8 | 52.4 | 47.9 | 48.9 | 50.6 | 51.9 |      |      |

It is claimed that the intensive training has led to a decrease in the median time taken to run one lap of the track.

Carry out a Wilcoxon signed-rank test, at the 5% significance level, to test whether there is sufficient evidence to support the claim. [9]