

1. A rugby team committed serious disciplinary offences in 36% of its matches.

A random sample of 10 matches is taken.

(a) Using a binomial model, find the probability that the team committed serious disciplinary offences in

(i) exactly 3 of the 10 matches,

(ii) more than half of the 10 matches.

(3)

The rugby coach introduces a new training system.

The aim is to reduce the proportion of matches in which the team commits serious disciplinary offences to less than 36%

After completing the training, the team committed serious disciplinary offences in 4 of its next 25 matches.

The coach claims that the new training system has been successful.

(b) Use a binomial distribution with a suitable test to investigate the coach's claim. You should state your hypotheses clearly and use a 5% level of significance.

(4)

(c) State an assumption required for a binomial distribution to be a suitable model for the test in part (b).

Comment on whether or not your assumption is reasonable.

(2)