4. In a game of *Sixes*, each player's turn involves rolling 6 identical dice.
If the player gets a six on fewer than 3 dice, the player does not score points.

Assuming that the dice are fair, find the probability that in one turn a player

(a) (i) gets a six on exactly 3 dice

(ii) gets a six on at least 3 dice

(3)

Ali and four of his friends play *Sixes* together and have one turn each.
Two of the 5 players score points.

Ali claims that this suggests the dice are biased towards rolling a six.

(b) Carry out a suitable test to investigate Ali's claim.
You should

- state your hypotheses clearly
- use a 5% level of significance
- state the p-value for the test

(4)