3. *Superbounce* is a manufacturer of tennis balls.

It knows from past records that 10% of its tennis balls fail a bounce test.

(a) Find the probability that from a random sample of 10 of these tennis balls

(i) at least 4 fail the bounce test

(ii) more than 1 but fewer than 5 fail the bounce test.

(4)

The managing director makes changes to the production process and claims that these changes will reduce the probability of its tennis balls failing the bounce test.

After the changes were made a random sample of 50 of the tennis balls were tested and it was found that 2 failed the bounce test.

(b) Test, at the 5% significance level, whether or not this result supports the managing director's claim.

(4)

In a second random sample of n tennis balls it was found that none failed the bounce test. As a result of this sample, the managing director's claim is supported at the 1% significance level.

(c) Find the smallest possible value of n

(3)

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Question 3 continued

(Total for Question 3 is 11 marks)