5. It is known that a particular variety of tulip produces yellow flowers with a probability of 0.25

A random sample of 15 tulips of this variety is purchased.

(a) Find the probability that more than 4 of these tulips will produce yellow flowers.

(2)

(b) Find the least number of tulips that needs to be purchased so that the probability of at least 1 tulip producing yellow flowers exceeds 0.95

(3)

Another random sample of 100 tulips of this variety is purchased.

(c) Use a suitable approximation to find the probability that, of these 100 tulips, more than 21 but no more than 30 will produce yellow flowers.
Show your working clearly.

(*Solutions relying entirely on calculator technology are not acceptable.*)

(5)

For this particular variety, it is thought that the probability of a tulip producing red flowers is 0.3

A random sample of 25 tulips of this variety was purchased. When these tulips flowered, 10 of them produced red flowers.

(d) Use this random sample of 25 tulips to test whether this variety of tulip has a probability greater than 0.3 of producing red flowers.
Use a 10% level of significance and state your hypotheses clearly.

(5)

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Question 5 continued

(Total for Question 5 is 15 marks)