

Question 14

You cannot start moving in the board game 'Ludo' until you have thrown a six on a six-sided die. What is the probability that you will need at least four rolls to achieve a six? You should assume that the die you use is fair.

[2]

$$P(X \geq 4) = 1 - (1 - \frac{1}{6})^4$$

$$= 1 - 0.4823 = 0.5177$$

$$P(X \geq 4) = 1 - P(1) - P(2) - P(3) - P(4)$$

$$= 1 - \frac{1}{6} - \frac{5}{6} \times \frac{1}{6} - \frac{1}{6} \times \frac{5}{6} - \frac{1}{6} \times \frac{5}{6} \times \frac{5}{6}$$

$$= 0.4823$$

Question 15

What is the upper quartile of the continuous uniform distribution on $[0, 1]$?

[1]

$$F(x) = x$$

$$x = 0.75$$

Question 16

Comment on the following statement (*Money Box*, BBC Radio 4, March 1994):
'I've worked out that you'd have to hold the [premium] bonds for 14 000 years to be certain of winning the million.'

[1]