

Binomial Distribution – 2021 AS

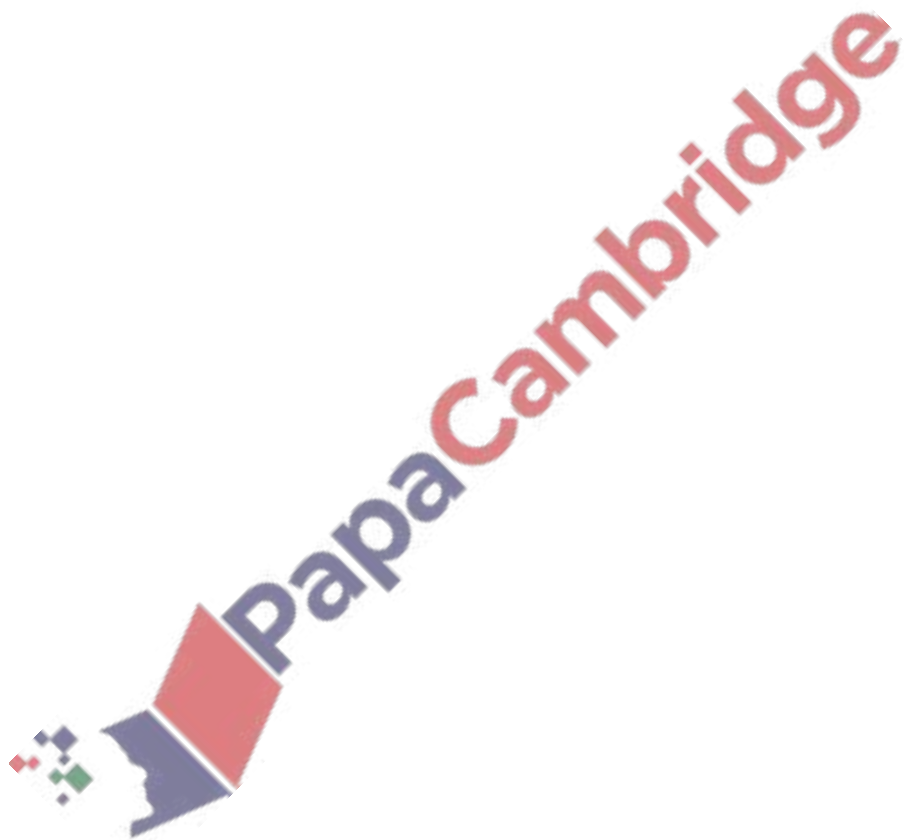
1. June/2021/Paper_9709/51/No.6a

In Questa, 60% of the adults travel to work by car.

(a) A random sample of 12 adults from Questa is taken.

Find the probability that the number who travel to work by car is less than 10.

[3]



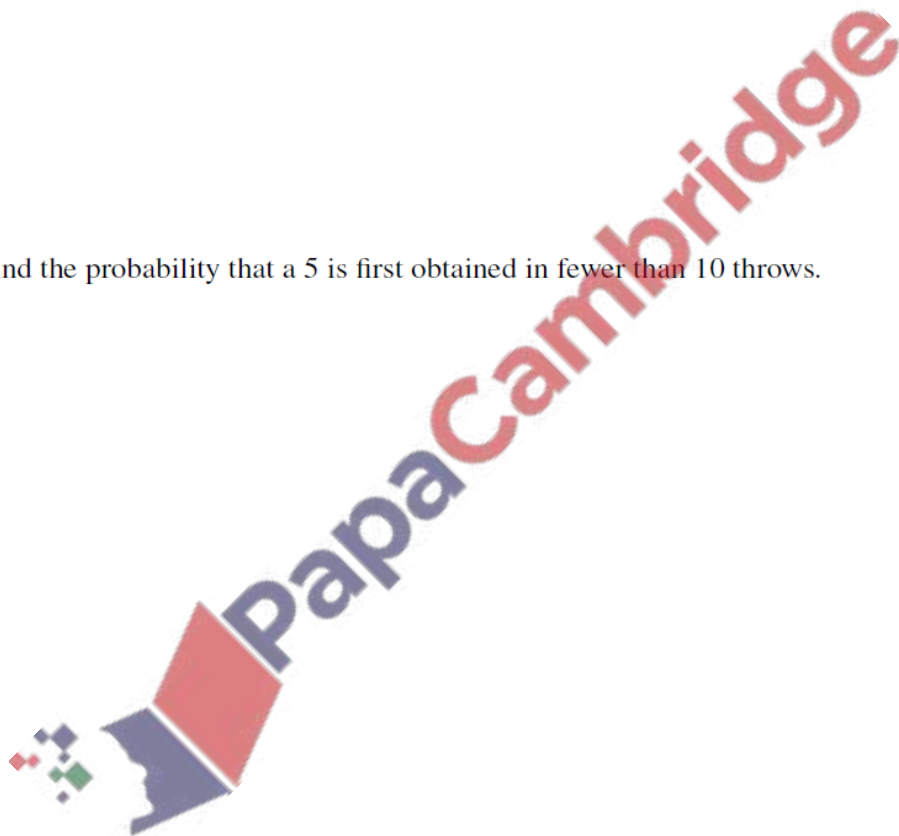
2. June/2021/Paper_9709/52/No.1

An ordinary fair die is thrown repeatedly until a 5 is obtained. The number of throws taken is denoted by the random variable X .

(a) Write down the mean of X . [1]

(b) Find the probability that a 5 is first obtained after the 3rd throw but before the 8th throw. [2]

(c) Find the probability that a 5 is first obtained in fewer than 10 throws. [2]

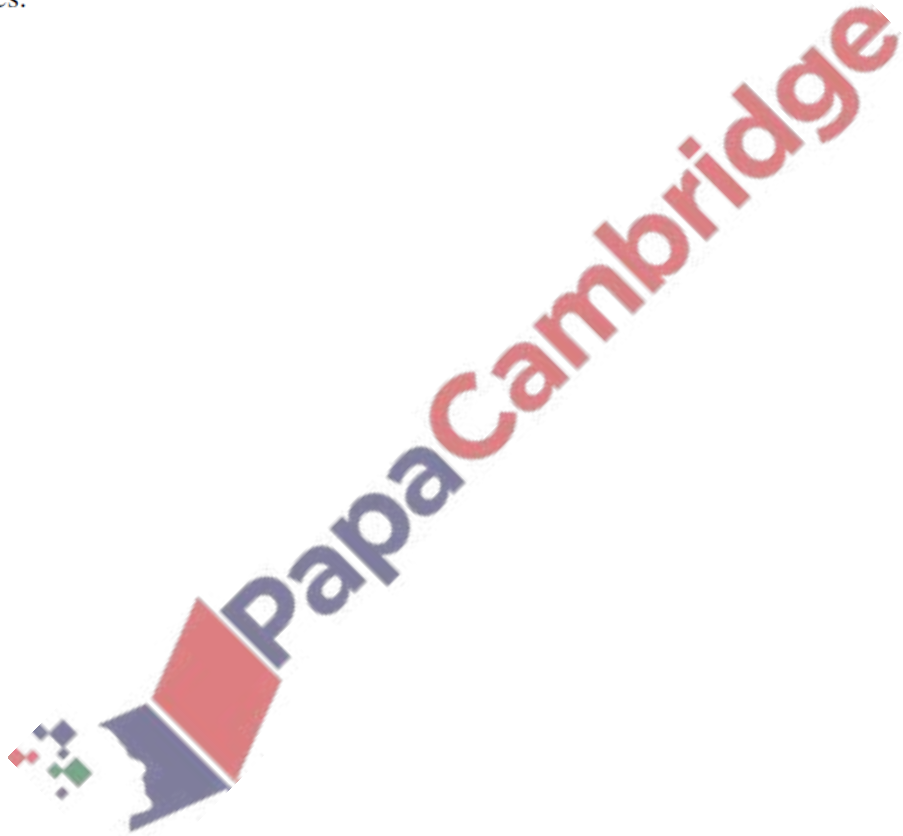


3. June/2021/Paper_9709/52/No.5a,5b

Every day Richard takes a flight between Astan and Bejin. On any day, the probability that the flight arrives early is 0.15, the probability that it arrives on time is 0.55 and the probability that it arrives late is 0.3.

(a) Find the probability that on each of 3 randomly chosen days, Richard's flight does not arrive late. [1]

(b) Find the probability that for 9 randomly chosen days, Richard's flight arrives early at least 3 times. [3]

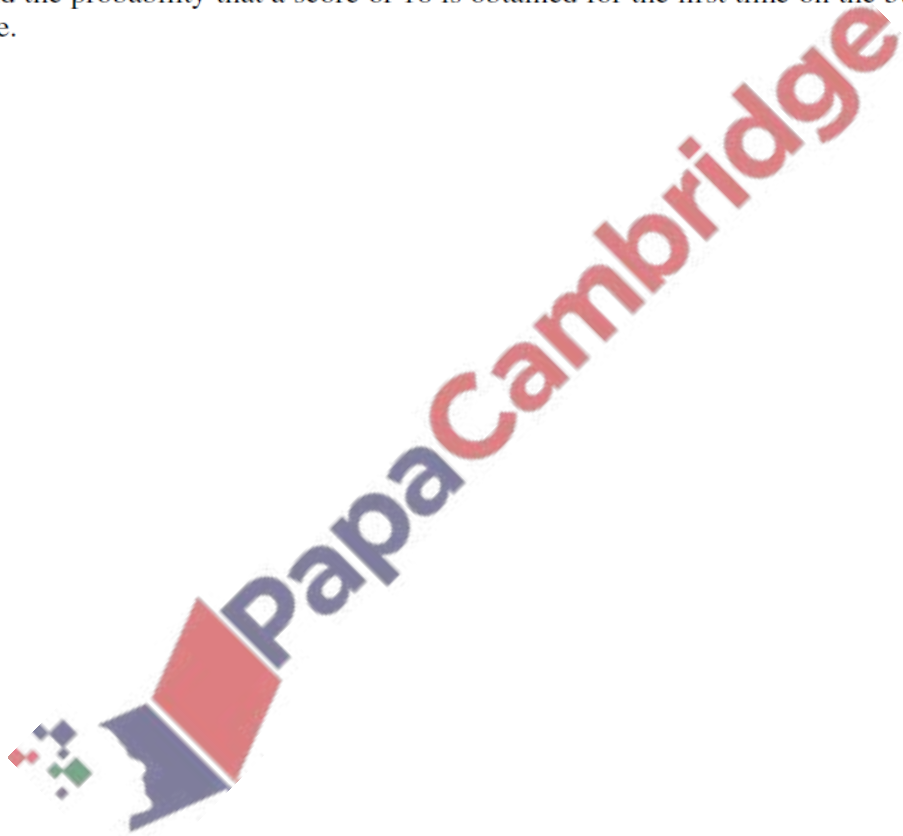


4. June/2021/Paper_9709/53/No.4

Three fair six-sided dice, each with faces marked 1, 2, 3, 4, 5, 6, are thrown at the same time, repeatedly. For a single throw of the three dice, the score is the sum of the numbers on the top faces.

(a) Find the probability that the score is 4 on a single throw of the three dice. [3]

(b) Find the probability that a score of 18 is obtained for the first time on the 5th throw of the three dice. [3]

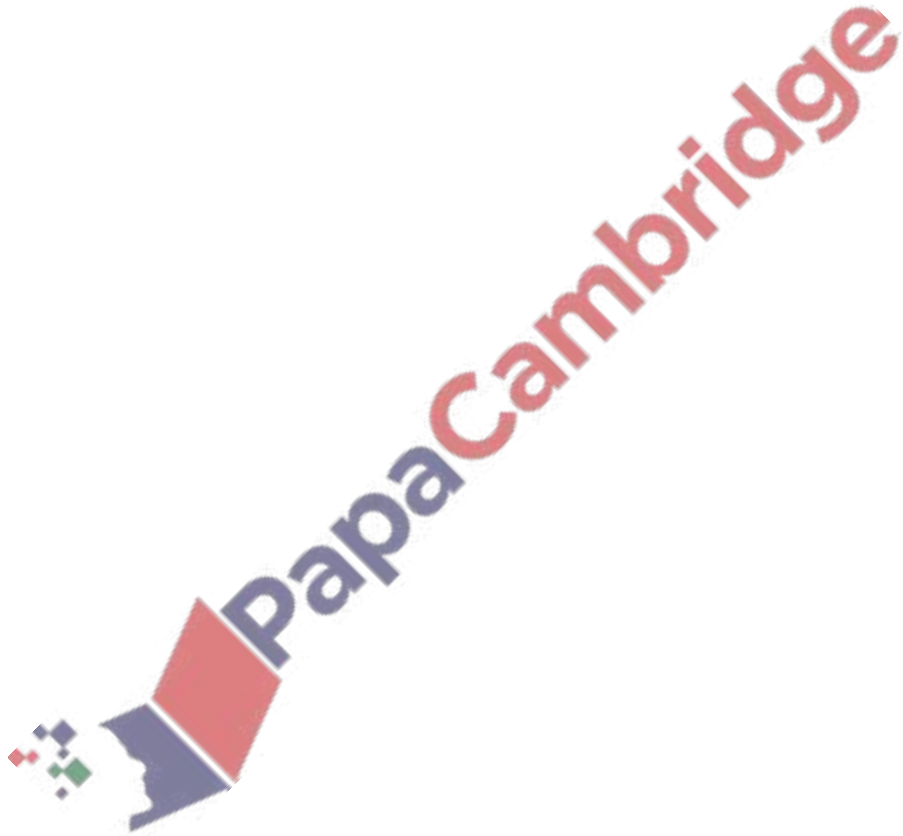


5. March/2021/Paper_9709/52/No.1

A fair spinner with 5 sides numbered 1, 2, 3, 4, 5 is spun repeatedly. The score on each spin is the number on the side on which the spinner lands.

(a) Find the probability that a score of 3 is obtained for the first time on the 8th spin. [1]

(b) Find the probability that fewer than 6 spins are required to obtain a score of 3 for the first time. [2]



6. March/2021/Paper_9709/52/No.2

Georgie has a red scarf, a blue scarf and a yellow scarf. Each day she wears exactly one of these scarves. The probabilities for the three colours are 0.2, 0.45 and 0.35 respectively. When she wears a red scarf, she always wears a hat. When she wears a blue scarf, she wears a hat with probability 0.4. When she wears a yellow scarf, she wears a hat with probability 0.3.

(a) Find the probability that on a randomly chosen day Georgie wears a hat. [2]

(b) Find the probability that on a randomly chosen day Georgie wears a yellow scarf given that she does not wear a hat. [3]

