

AQA

A Level

A Level Mathematics

**Appropriate Probability
Distributions**

Name:

M M E

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Total Marks:

N3- Appropriate Probability Distributions- Questions

AQA

1) For the following state whether it could be modelled with a binomial or normal distribution. [5]

- i) The number of heads from 10 flips a fair two-sided coin
- ii) The number of sisters you have
- iii) The time a processor lasts
- iv) The concentration of chemical x in blood (mg/ml)
- v) The probability of getting a six on a die from 100 rolls.

2) A company makes biscuits and has a set of roller cutters. For efficiency reasons, once one roller stops produces biscuits or the correct dimensions the whole set are replaced. The variable B represents the scaled number of biscuits each cutter makes before it is replaced. The distribution of B has a mean of 25 and standard deviation of 2.

- i) Find the probability that a randomly selected cutter, B , is less than 23. [3]
- ii) 95% of cutters last for more than n biscuits. Find n . [3]
- iii) An inspector takes five samples. Determine the probability that fewer than two of them will have a life span less than 23. [4]

3) A stratified sample of information regarding 100 wild hares has been given to you. Experts agree that this sample is representative of the whole population.

Colour	Grey	Black	Brown	White
Frequency	8	21	62	9

- i) State the probability that the next hare observed will have a grey coat. [1]
- ii) Find the probability of 9 rabbits in the next 100 being white. [2]

The same set of rabbits also had their weight w recorded. These records are shown in the table below.

Weight (kg)	$w < 1.5$	$1.5 \leq w < 2$	$2 \leq w < 2.5$	$2.5 \leq w < 3$
Frequency	15	32	29	24

- iii) State, or other, the probability of picking fewer than 320 rabbits from the next 1,000 with a weight greater than 1.5 kg but less than 2 kg. [7]