

No Calculator for the first 3

Review exercise



EXAM-STYLE QUESTIONS

- 1** The table shows the probability distribution of a discrete random variable X .
- Find the value of k .
 - Find the expected value of X .

x	-2	-1	0	1	2
$P(X = x)$	0.3	$\frac{1}{k}$	$\frac{2}{k}$	0.1	0.1

- 2** The probability distribution of a discrete random variable X is defined by $P(X = x) = cx(6 - x)$, $x = 1, 2, 3, 4, 5$.
- Find the value of c .
 - Find $E(X)$.

EXAM-STYLE QUESTION

- 5** In a train, $\frac{1}{3}$ of the passengers are listening to music. Five passengers are chosen at random. Find the probability that exactly three are listening to music.

Calculator Allowed:

EXAM-STYLE QUESTION

- 2** I like 30% of the songs on my friends MP3 player. If I choose eight songs at random
- find the probability that I like exactly three songs
 - find the probability that I like at least three songs.

EXAM-STYLE QUESTION

- 4** In a large school one person in five is left-handed.
- A random sample of 10 people is taken. Find the probability that
 - exactly four will be left-handed
 - more than half will be left-handed.
 - Find the most likely number of left-handed people in the sample of 10 people.
 - How large must a random sample be if the probability that it contains at least one left-handed person is to be greater than 0.95?

EXAM-STYLE QUESTIONS

- 7** The lifespans of certain batteries are normally distributed. It is found that 15% of batteries last less than 30 hours and 10% of batteries last more than 50 hours. Find the mean and standard deviation of the lifespans of the batteries.

- 8** The time taken for Samuel to get to school each morning is normally distributed with a mean of μ minutes and a standard deviation of 2 minutes.
- The probability that the journey takes more than 35 minutes is 0.2.
- Find the value of μ .
- Samuel should be at school at 08:45 each morning and so on five consecutive days he sets out at 08:10.
- Find the probability that he arrives before 08:45 on all five days.
 - Find the probability he is late on at least two days.

Calculator Allowed:



Review exercise

- Let $P(C) = 0.4$, $P(D) = 0.5$, $P(C | D) = 0.6$.
 - Find $P(C \text{ and } D)$.
 - Are C and D mutually exclusive? Give a reason for your answer.
 - Are C and D independent events? Give a reason for your answer.
 - Find $P(C \text{ or } D)$.
 - Find $P(D | C)$.

EXAM-STYLE QUESTIONS

- Max travels to school each day by bicycle, by bus or by car. The probability that he travels by bus on any day is 0.6. The probability that he travels by bicycle on any day is 0.3.
 - Draw a tree diagram which shows the possible outcomes for Max's journeys on Monday and Tuesday. Label the tree clearly, writing in the probabilities of each outcome.
 - What is the probability that he travels
 - by bicycle on Monday and Tuesday,
 - by bicycle on Monday and by bus on Tuesday,
 - by the same method of travel on Monday and Tuesday?
 - Max traveled to school by bicycle on Monday and Tuesday. What is the probability that he does not travel to school by bicycle on Wednesday and Thursday and Friday?
 - What is the probability that in any three days Max travels twice by car and once by bus or twice by bicycle and once by car?

EXAM-STYLE QUESTION

- 5** On a walk I count 70 rabbits, 42 are female, 34 are not eating carrots and 23 are female and not eating carrots.
Draw a Venn diagram and hence find the number that are both female and eating carrots.
- a** What is the probability that a rabbit is male and not eating carrots?
 - b** What is the probability that a rabbit is female given that it is eating carrots?
 - c** Is being female independent of eating carrots? Justify your answer.
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