



Additional Assessment Materials

Summer 2021

Pearson Edexcel GCE in As Mathematics

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Resource Set 1: Topic 4

Statistical distribution

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Additional Assessment Materials, Summer 2021

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Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an optional part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

1. A fair 5-sided spinner has sides numbered 1, 2, 3, 4 and 5

The spinner is spun once and the score of the side it lands on is recorded.

- (a) Write down the name of the distribution that can be used to model the score of the side it lands on.

(1)

The spinner is spun 28 times.

The random variable X represents the number of times the spinner lands on 2

- (b) (i) Find the probability that the spinner lands on 2 at least 7 times.

- (ii) Find $P(4 \leq X < 8)$

(5)

(Total for Question 1 is 6 marks)

2. Afrika works in a call centre.

She assumes that calls are independent and knows, from past experience, that

on each sales call that she makes there is a probability of $\frac{1}{6}$ that it is successful.

Afrika makes 9 sales calls.

- (a) Calculate the probability that at least 3 of these sales calls will be successful.

(2)

The probability of Afrika making a successful sales call is the same each day.

Afrika makes 9 sales calls on each of 5 different days.

- (b) Calculate the probability that at least 3 of the sales calls will be successful on exactly
1 of these days.

(2)

Rowan works in the same call centre as Afrika and believes he is a more successful

salesperson.

To check Rowan's belief, Afrika monitors the next 35 sales calls Rowan makes and finds that 11 of the sales calls are successful.

(c) Stating your hypotheses clearly test, at the 5% level of significance, whether or not there is evidence to support Rowan's belief.

(4)

(Total for Question 2 is 8 marks)

3. A biased spinner can only land on one of the numbers 1, 2, 3 or 4. The random variable X represents the number that the spinner lands on after a single spin and $P(X = r) = P(X = r + 2)$ for $r = 1, 2$.

Given that $P(X = 2) = 0.35$,

- (a) find the complete probability distribution of X . (2)

Ambroh spins the spinner 60 times.

- (b) Find the probability that more than half of the spins land on the number 4.
Give your answer to 3 significant figures. (3)

The random variable $Y = \frac{12}{X}$.

- (c) Find $P(Y - X \leq 4)$. (3)

(Total for Question 3 is 8 marks)