



Cambridge International AS & A Level

CANDIDATE
NAME
CENTRE
NUMBER

--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--

MATHEMATICS

9709/63

Paper 6 Probability & Statistics 2

May/June 2024

1 hour 15 minutes

You must answer on the question paper.

You will need: List of formulae (MF19)

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined page at the end of this booklet; the question number or numbers must be clearly shown.
- You should use a calculator where appropriate.
- You must show all necessary working clearly; no marks will be given for unsupported answers from a calculator.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [].

This document has 12 pages.

(a) Use a suitable approximating distribution to find $P(2 \leq X < 5)$.

[3]

[1]

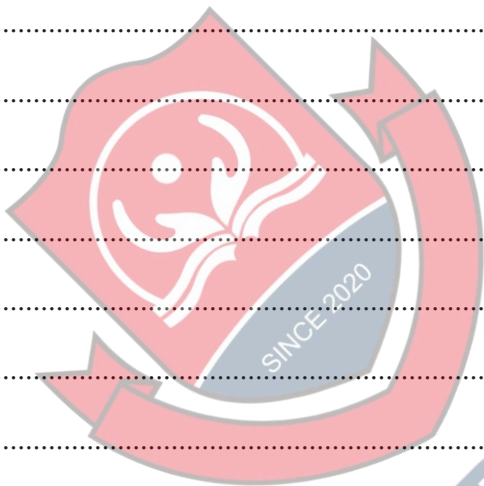
.....

.....

.....



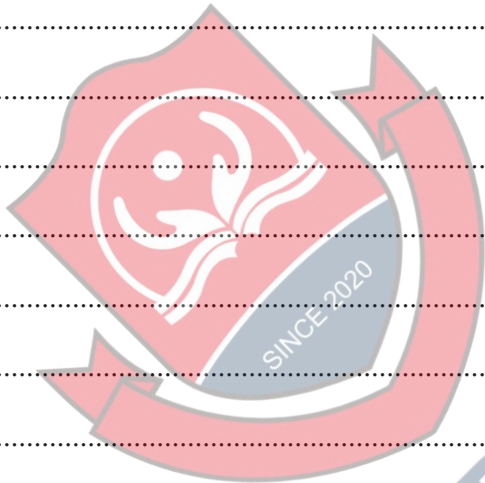
- (a) Calculate an estimate of the population standard deviation. [3]



4Uadmission

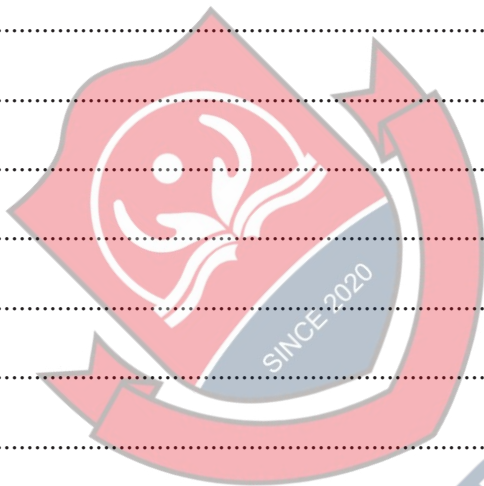
-
-
-

- Find the probability that the total mass of 5 randomly chosen large bags of cement is greater than the total mass of 10 randomly chosen small bags of cement. [5]





Test at the 5% significance level whether support for the Today Party has decreased. [5]



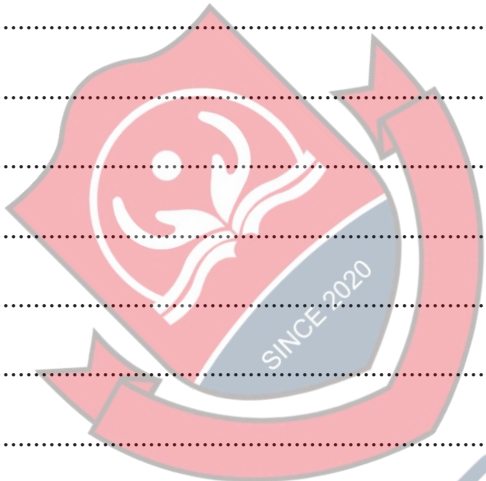


5 A random variable X has probability density function f given by

$$f(x) = \begin{cases} ax - x^3 & 0 \leq x \leq \sqrt{2}, \\ 0 & \text{otherwise,} \end{cases}$$

where a is a constant.

(a) Show that $a = 2$. [3]



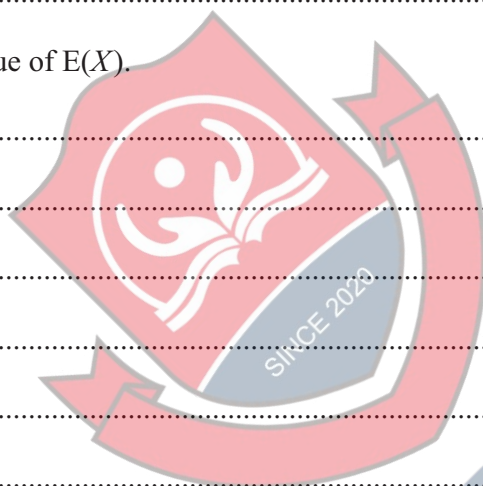
(b) Find the median of X . [4]

[illegible]



(c) Find the exact value of $E(X)$.

[3]



4Uadmission



DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

- DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

(b) State suitable null and alternative hypotheses for the test. [1]

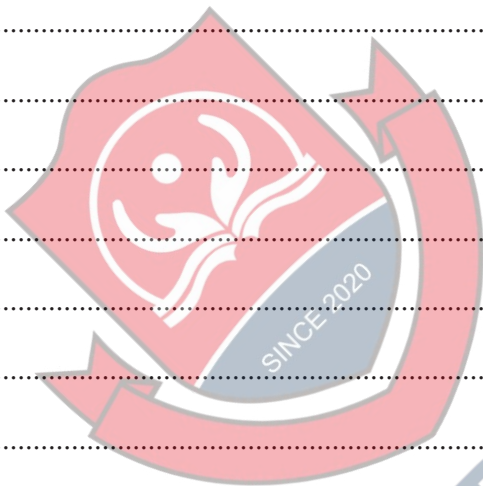
.....

.....

.....



[4]



[error.

[1]

[illegible]

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN



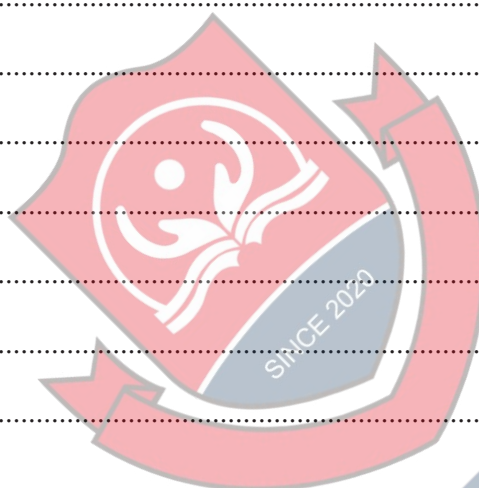
DO NOT WRITE IN THIS MARGIN

4Uadmission

- (c) A sample of 60 randomly chosen pairs of values of X and Y is taken, and the value of $X + Y$ is calculated for each pair. The sample mean of these 60 values is found.

Find the probability that the sample mean of $X + Y$ is less than 4.0 .

[6]



DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN