

- 1** A summary of 20 values of x gives

$$\Sigma(x-30) = 439, \quad \Sigma(x-30)^2 = 12\,405.$$

A summary of another 25 values of x gives

$$\Sigma(x-30) = 470, \quad \Sigma(x-30)^2 = 11346.$$

- (a) Find the mean of all 45 values of x . [2]

- (b) Find the standard deviation of all 45 values of x . [2]

4Uadmis

- 2 The lengths of the tails of adult raccoons of a certain species are normally distributed with mean 28 cm and standard deviation 3.3 cm.

- (a) Find the probability that a randomly chosen adult raccoon of this species has a tail length between 23 cm and 35 cm. [4]



The masses of adult raccoons of this species are normally distributed with mean 8.5 kg and standard deviation σ kg. 75% of adult raccoons of this species have mass greater than 7.6 kg.

- (b) Find the value of σ . [3]

4Uac

3 The heights, in cm, of 200 adults in Barimba are summarised in the following table.

Height (h cm)	$130 \leq h < 150$	$150 \leq h < 160$	$160 \leq h < 170$	$170 \leq h < 175$	$175 \leq h < 195$
Frequency	16	32	76	64	12

(a) Draw a histogram to represent this information.

[4]



- (b) The interquartile range is R cm. Show that R is **not** greater than 15.

[2]



- 4 A game for two players is played using a fair 4-sided dice with sides numbered 1, 2, 3 and 4. One turn consists of throwing the dice repeatedly up to a maximum of three times. When a 4 is obtained, no further throws are made during that turn. A player who obtains a 4 in their turn scores 1 point.

- (a)** Show that the probability that a player obtains a 4 in one turn is $\frac{37}{64}$. [2]



Xeno and Yao play this game.

- (b) Find the probability that neither Xeno nor Yao score any points in their first two turns. [1]

4Uadmin

- (c) Xeno and Yao each have three turns.

Find the probability that Xeno scores 2 more points than Yao.

[3]



- 5 In a certain area in the Arctic the probability that it snows on any given day is 0.7, independent of all other days.

- (a) Find the probability that in a week (7 days) it snows on at least five days. [3]



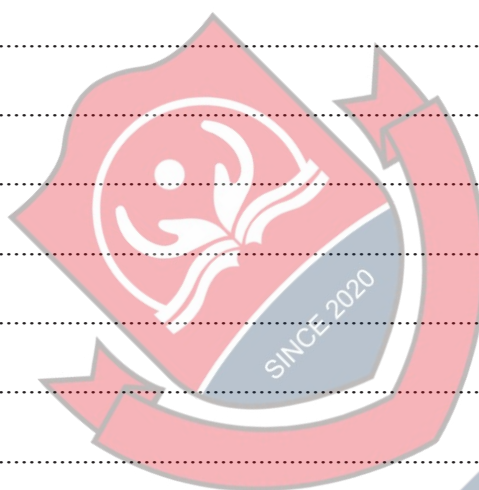
A week in which it snows on at least five days out of seven is called a 'white' week.

- (b) Find the probability that in three randomly chosen weeks at least one is a white week. [2]

400

In a different area in the Arctic, the probability that a week is a white week is 0.8 .

- (c) Use a suitable approximation to find the probability that in 60 randomly chosen weeks fewer than 47 are white weeks. [5]



4Uadmission

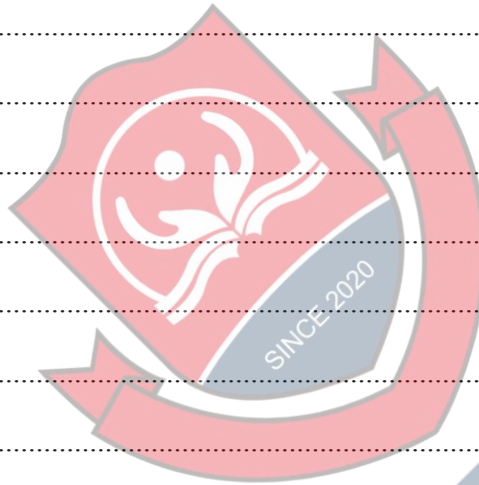
6 Harry has three coins:

- One coin is biased so that the probability of obtaining a head when it is thrown is $\frac{1}{3}$.
- The second coin is biased so that the probability of obtaining a head when it is thrown is $\frac{1}{4}$.
- The third coin is biased so that the probability of obtaining a head when it is thrown is $\frac{1}{5}$.

Harry throws the three coins. The random variable X is the number of heads that he obtains.

(a) Draw up the probability distribution table for X .

[4]



4Uadmission

Harry has two other coins, each of which is biased so that the probability of obtaining a head when it is thrown is p . He throws all five coins at the same time. The random variable Y is the number of heads that he obtains.

- (b) Given that $P(Y = 0) = 6P(Y = 5)$, find the value of p . [3]

7 The eight digits 1, 2, 2, 3, 4, 4, 4, 5 are arranged in a line.

(a) How many different arrangements are there of these 8 digits?

[1]

[illegible]

(b) Find the number of different arrangements of the 8 digits in which there is a 2 at the beginning, a 2 at the end and the three 4s are not all together. [4]

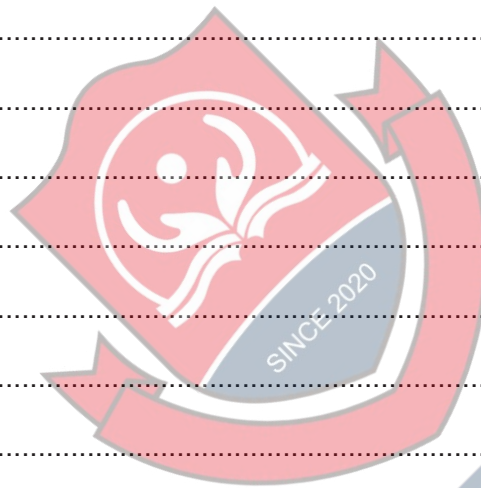


4Uadmission

- 
- SINCE 2020
- 4Uadmission

Additional page

If you use the following lined page to complete the answer(s) to any question(s), the question number(s) must be clearly shown.



4Uadmission



BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.