

Please answer questions on separate sheets of paper. Do not write on here!

PREPARING FOR A LEVEL STATISTICS

We hope you are looking forward to the challenge of A level Statistics. It is a demanding subject but it will also equip you with a range of useful skills which will be transferable to many other subjects.

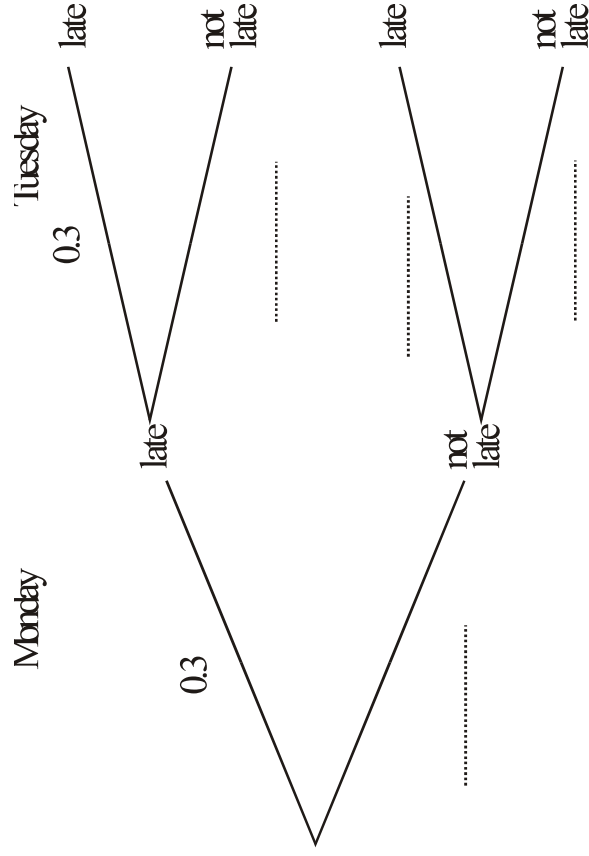
- ✓ Statistics will depend upon a sound foundation of knowledge and skills built up in your GCSE mathematics (and possibly statistics) course.
- ✓ In particular we feel that to stand a good chance of success at A level you need to come in September already confident in your understanding of probability, types of average & measures of spread, sampling methods and diagrams such as histograms, cumulative frequency and boxplots.
- ✓ For this reason we will be giving you an initial test on these topics within the first fortnight of the Autumn term. This is partly to encourage you to be well prepared as you start the course but also to help us identify any students who may need some extra support.
- ✓ What follows are a series of questions based on these topics (you should have met them in your GCSE course). When you start AS level we will assume you have the skills required to solve these problems.
- ✓ You will be asked to mark your work using answers available through the school website and issued with a self-assessment sheet which you will hand in with your work before you take the initial test.
- ✓ Feel free to come to us with questions in September. We will be only too happy to go over anything you may have had problems with. Some students do find the transition from GCSE to AS level difficult and there will be opportunities for them to receive extra support throughout the year.

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1. Salika travels to school by train every day.

The probability that her train will be late on any day is 0.3

- (a) Copy and complete the probability tree diagram for Monday and Tuesday.



- (b) Work out the probability that her train will be late on **at least one** of these two days.

(Total 5 marks)

2. Jim spins a biased coin.

The probability that it will land on heads is twice the probability that it will land on tails.

Jim spins the coin twice.

Find the probability that it will land once on heads and once on tails.

(Total 4 marks)

3. A bag contains 6 red disks, 4 blue disks and 5 green disks.
A fair dice has 4 faces painted red and the other 2 faces painted blue.

Lisa takes a disk at random from the bag and records its colour.

Lisa then throws the dice twice and each time records the colour of the face it lands on.

Work out the probability that all three of the three colours Lisa records are red.

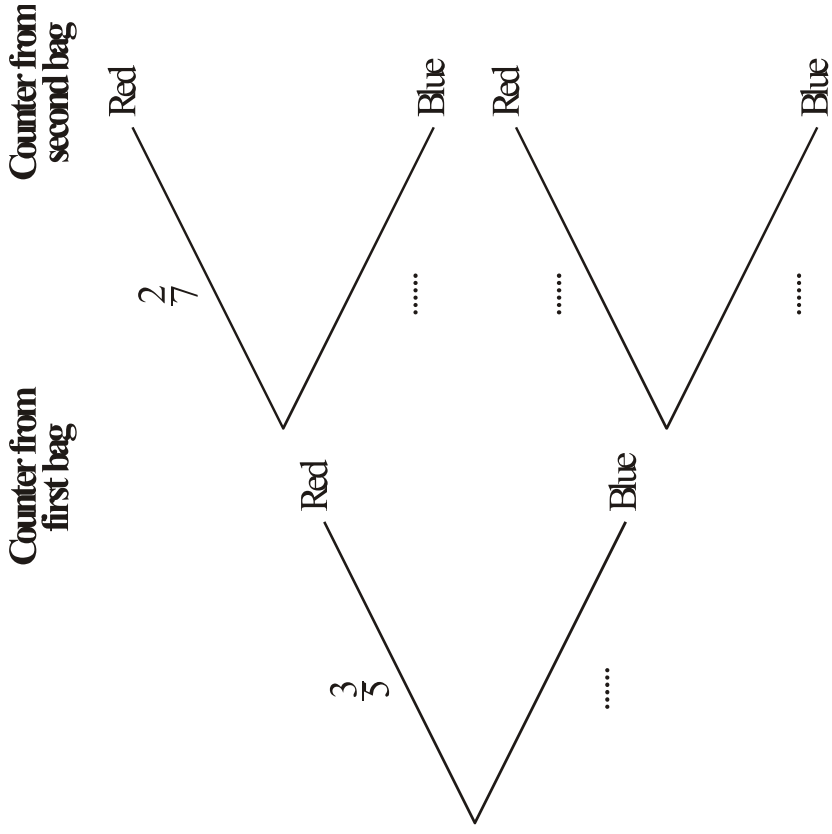
(Total 2 marks)

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4. Loren has two bags.
 The first bag contains 3 red counters and 2 blue counters.
 The second bag contains 2 red counters and 5 blue counters.

Loren takes one counter at random from each bag.

- (a) Copy and complete the probability tree diagram.



- (b) Work out the probability that Loren takes one counter of each colour. (Total 5 marks)

5. The table gives information about the ages of 160 employees of an IT company.

- (a) Complete the cumulative frequency table.

Age (A) in years	Frequency	Cumulative Frequency
$15 < A \leq 25$	44	
$15 < A \leq 35$	56	
$15 < A \leq 45$	34	
$15 < A \leq 55$	19	
$15 < A \leq 65$	7	

- (b) Draw a cumulative frequency graph for your table.

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- (c) Use your graph to find an estimate for
- (i) the median age of the employees,
 - (ii) the interquartile range of the ages of the employees.

Another IT company has 80 employees.

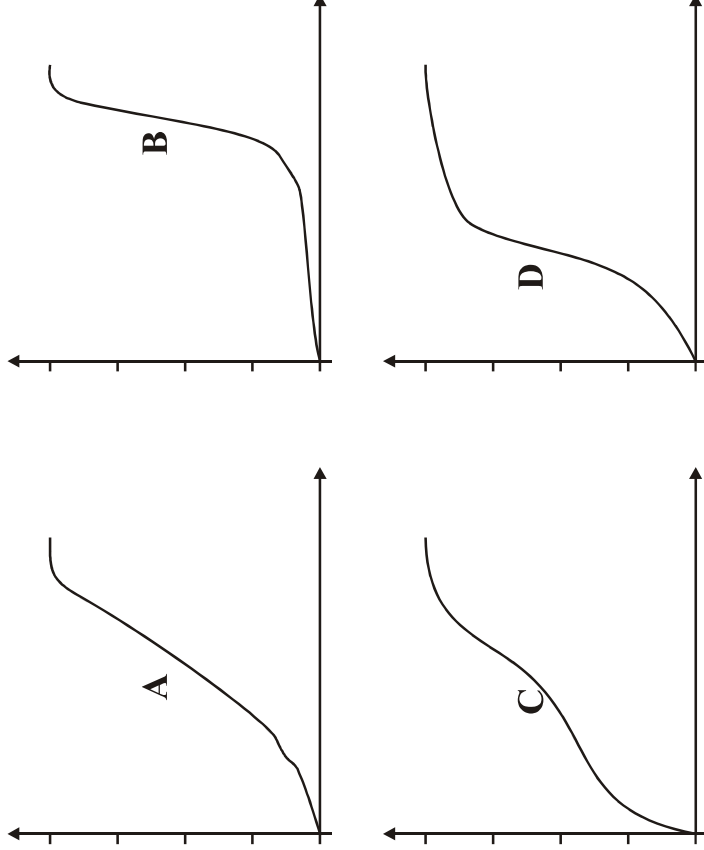
The age of the youngest employee is 24 years. and the age of the oldest employee is 54 years.

The median age is 38 years, the lower quartile age is 30 years and the upper quartile age is 44 years.

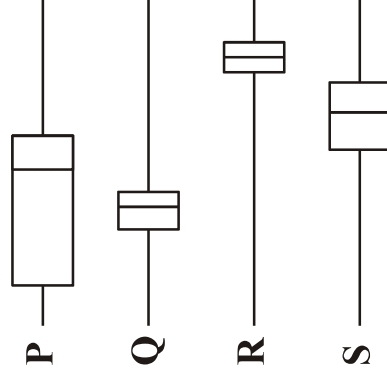
- (d) Draw a box plot to show information about the ages of the employees.

(Total 8 marks)

6. Here are four cumulative frequency diagrams.



Here are four box plots.

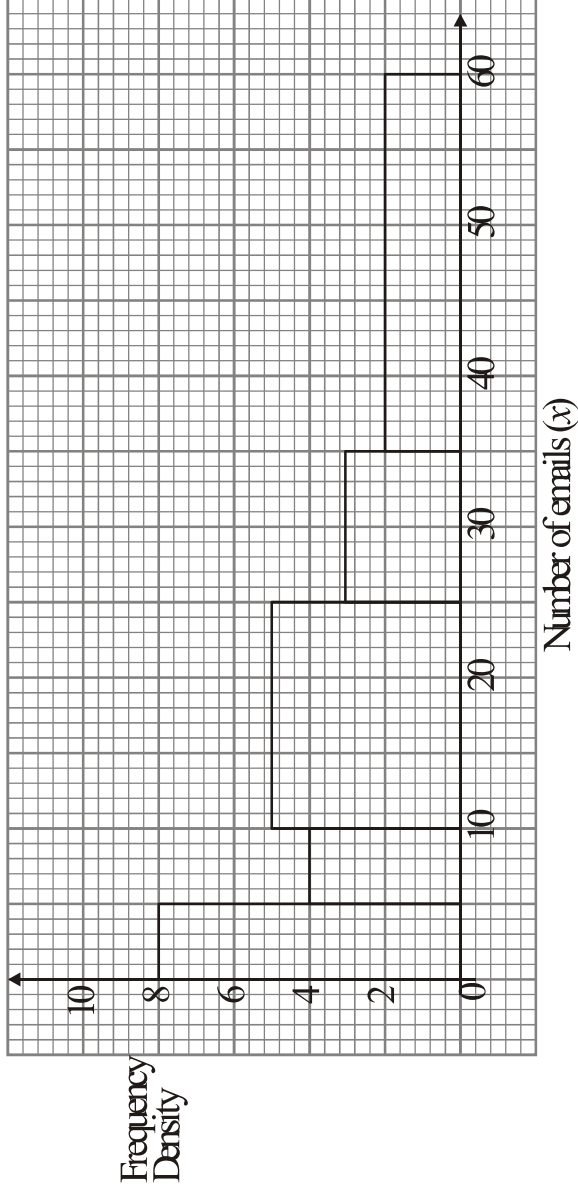


For each box plot, pair it with the appropriate cumulative frequency diagram.

(Total 2 marks)

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7. The histogram and table show information about the number of emails received by each of the students in a school.



Number of emails (x)	Frequency
$0 < x \leq 5$	
$5 < x \leq 10$	20
$10 < x \leq 25$	
$25 < x \leq 35$	
$35 < x \leq 60$	

Use the information in the histogram to complete the table.

(Total 2 marks)

8. Fred did a survey on the areas of pictures in a newspaper. The table gives information about the areas.

Area (A cm ²)	Frequency
$0 < A \leq 10$	38
$10 < A \leq 25$	36
$25 < A \leq 40$	30
$40 < A \leq 60$	46

- (a) Work out an estimate for the mean area of a picture.
 (b) Draw a histogram for the information given in the table.

(Total 7 marks)