AQA – Probability – GCSE Statistics – 2021

1. June/2022/Paper_8382/1F/No.1

An ordinary fair dice is rolled.

Circle the probability of rolling a 4.

[1 mark]

$\frac{1}{6}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{4}{6}$

2. June/2022/Paper_8382/1F/No.6

Miss Wardle records information about homework completion for her class.

	Homework complete	Homework not complete
Male	11	4
Female	12	2

(a) How many males did **not** complete this piece of homework?

[1 mark]

Answer _____

(b) What is the probability that a student, chosen at random, completed this piece of homework?

[2 marks]

_____

_____

_____

Answer _____

(c) Miss Wardle says that males are nearly twice as likely to **not** complete homework compared to females.

(c) (i) Show that the data in the table supports Miss Wardle's view.

[3 marks]

(c) (ii) Despite the support of the data, Miss Wardle might not be correct.

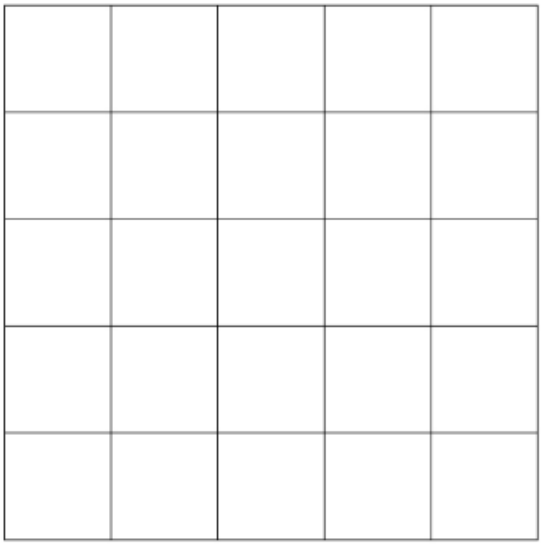
Why not?

[1 mark]

3. June/2022/Paper_8382/1F/No.11

Tate is going to play a game at a fair.

The game has a 5 by 5 grid and behind some of the 25 squares are prizes.



Tate decides he wants to pick one square **at random**.

Describe how he could use cards numbered 1 to 25 to do this.

[3 marks]

4. June/2022/Paper_8382/1H/No.3

A bag contains only 8 red balls and 5 blue balls.

A ball is taken out at random and not replaced.

A second ball is taken out at random.

If the first ball is blue, what is the probability the second ball is also blue?

Circle your answer.

[1 mark]

$\frac{1}{3}$ $\frac{5}{39}$ $\frac{5}{12}$ $\frac{4}{13}$

5. June/2022/Paper_8382/1H/No.10

Bob uses an alarm clock to wake him up on days he travels to work.

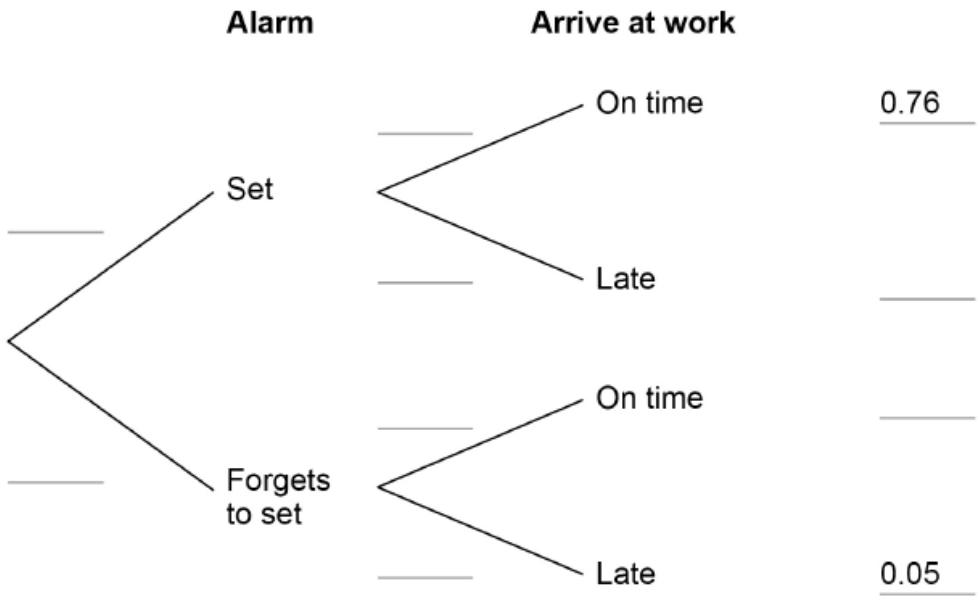
The probability that he remembers to set his alarm is four times more than the probability he forgets to set it.

The probability that he sets his alarm **and** then is on time for work is 0.76

The probability that he forgets to set his alarm **and** then is late for work is 0.05

(a) Complete the tree diagram below.

[4 marks]



(b) Bob travels to work on 225 days per year.

On how many days would he expect to be late for work?

[3 marks]

Answer _____ days

6. June/2022/Paper_8382/2F/No.3

The probability that a biased coin lands on heads is $\frac{2}{5}$

Circle the probability that this coin lands on tails.

[1 mark]

0.5 $\frac{2}{5}$ $\frac{3}{5}$ 40%

7. June/2022/Paper_8382/2F/No.8

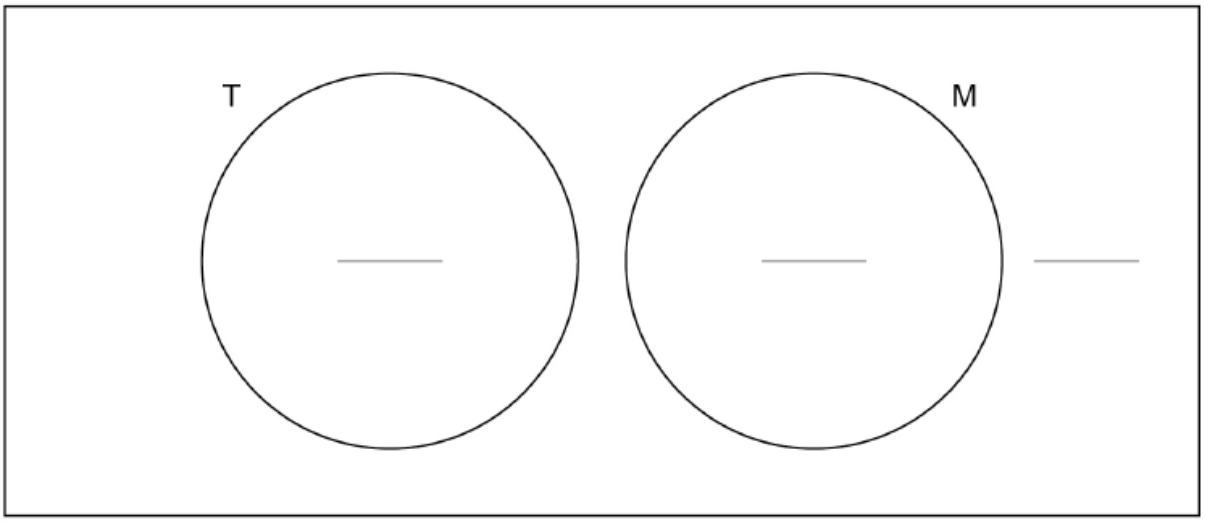
100 students go to London for a weekend on a school trip.

(a) On one afternoon, students can choose to go to a theatre (T) **or** visit a museum (M) **or** do neither.

- 16 chose to do neither.
- Three times as many chose the theatre as chose the museum.

Complete the Venn diagram.

[3 marks]



(b) One student is chosen at random.

What is the probability that they go to the museum?

[1 mark]

Answer _____

8. June/2022/Paper_8382/2F/No.9

Sanders owns a chicken farm where the chickens can roam freely.

He is investigating where the chickens tend to go in their field.

He,

- divides the field up into 9 squares
- counts the number of chickens in each square.

Here are the raw data showing how many chickens are in each square.
There is a food tray in the bottom right square.

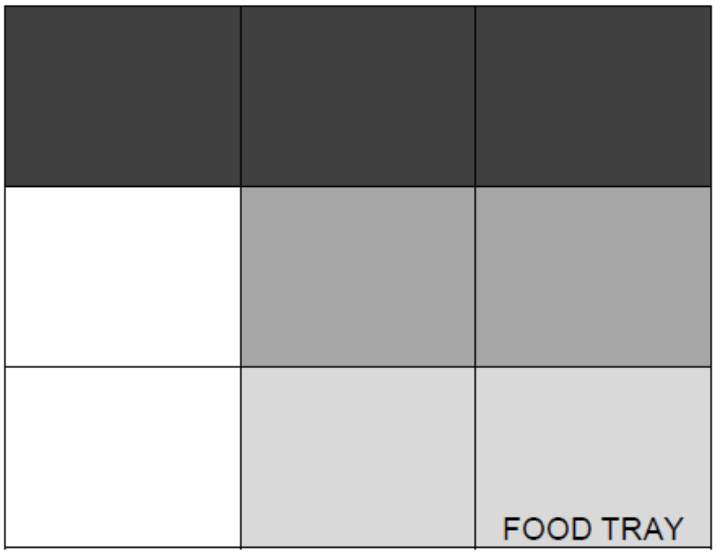
3	11	7
11	22	25
13	34	42 FOOD TRAY

(a) What is the probability that a chicken, chosen at random, is in the square with the food tray?

[2 marks]

Answer _____

(b) Sanders draws this choropleth map to represent the number of chickens in each square.



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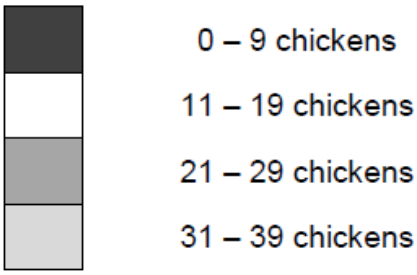


Write down **three** errors that Sanders has made.

[3 marks]

Error 1 _____

_____

_____

Error 2 _____

_____

_____

Error 3 _____

_____

_____

9. June/2022/Paper_8382/2F/No.11

The table shows information about the heights of a sample of 100 trees in a forest.

Height, h (m)	Frequency
$0 < h \leqslant 5$	8
$5 < h \leqslant 10$	23
$10 < h \leqslant 15$	40
$15 < h \leqslant 20$	19
$20 < h \leqslant 25$	10

(a) Complete the table below to show the cumulative frequencies for the data.

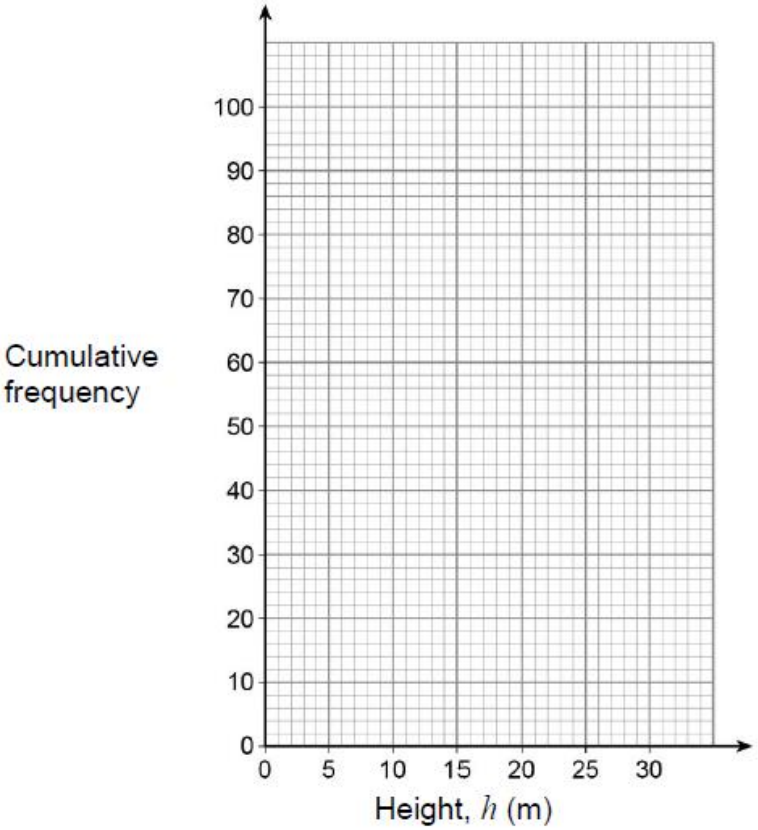
[2 marks]

Height, h (m)	Frequency
$0 < h \leqslant 5$	8
$5 < h \leqslant 10$	23
$10 < h \leqslant 15$	40
$15 < h \leqslant 20$	19
$20 < h \leqslant 25$	10

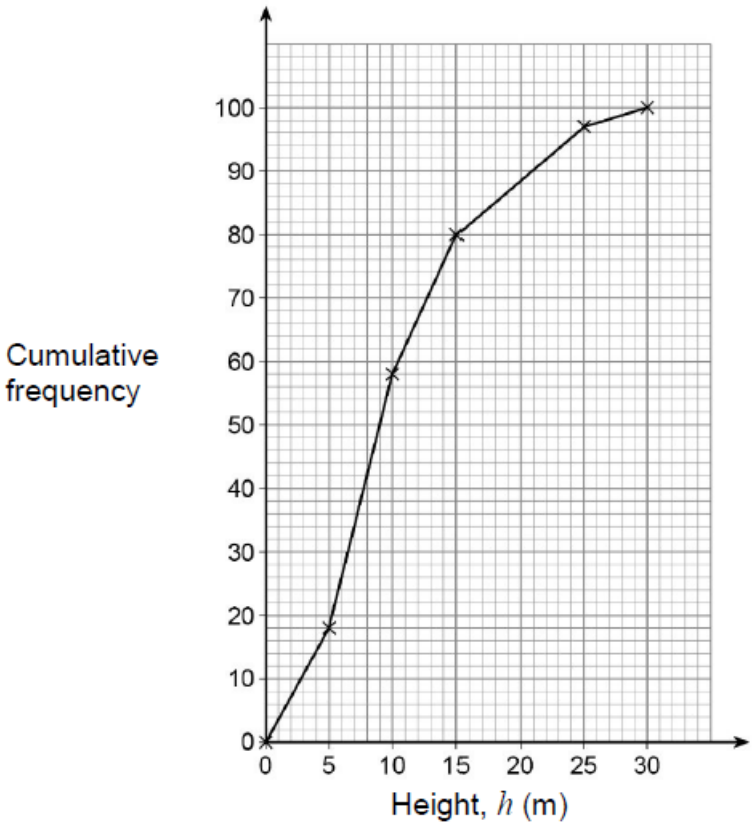
Height, h (m)	Cumulative frequency
$h \leqslant 5$	8
$h \leqslant 10$	
$h \leqslant 15$	
$h \leqslant 20$	
$h \leqslant 25$	100

(b) On the grid draw a cumulative frequency diagram for the data.

[3 marks]



(c) The cumulative frequency diagram below shows information about a sample of 100 trees in a **large field**.

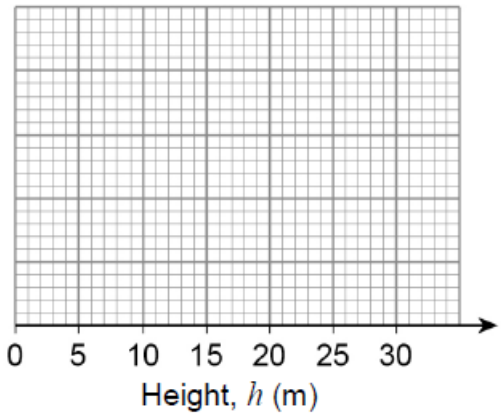


The shortest tree in the field is 1 m in height.

The tallest tree in the field is 27 m in height.

Use this information and the cumulative frequency diagram to complete a box plot for the trees in the field.

[4 marks]



10. June/2022/Paper_8382/2H/No.1

A fair coin is tossed four times.

Circle the probability of getting 'tails' on all 4 tosses.

[1 mark]

$\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{16}$

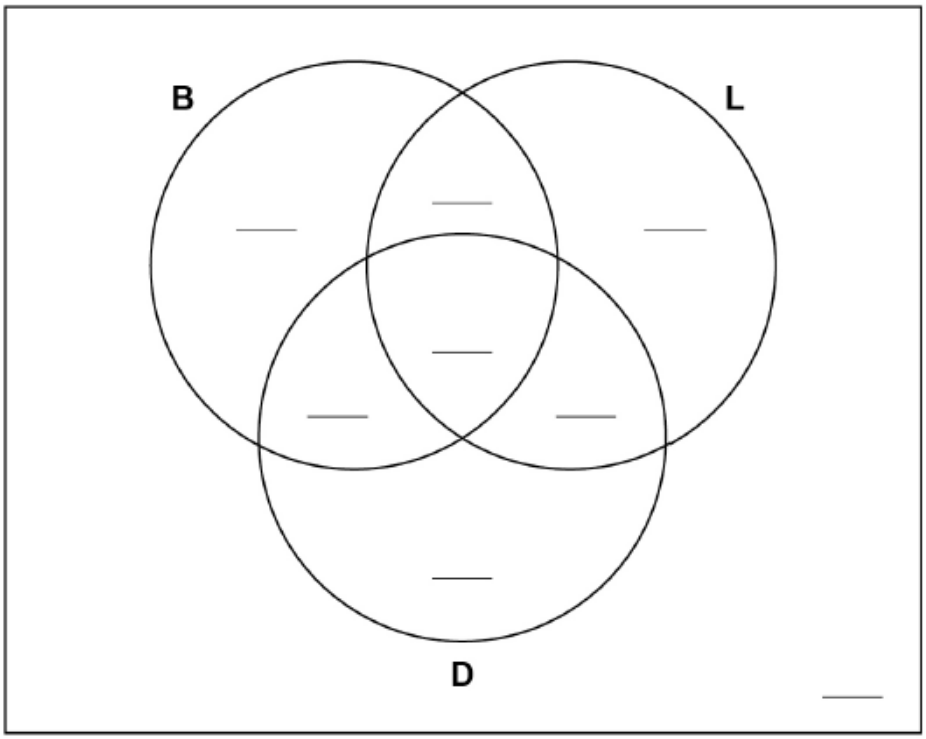
11. June/2022/Paper_8382/2H/No.8

100 people were asked whether they had hot food at breakfast (**B**), lunch (**L**) or dinner (**D**) yesterday,

- 54 **only** had hot food for dinner
- 1 person didn't have hot food for any meal
- no-one had hot food for all three meals
- a **total** of 4 people didn't have hot food for dinner
- the number of people who had hot breakfast **and** hot dinner is equal to the number of people who had hot lunch **and** hot dinner.

Complete the Venn diagram with a **possible** set of correct values.

[5 marks]



12. June/2022/Paper_8382/2H/No.9

There are 7 players who can play for a snooker team,

Micky, Katie, Niles, Tommo, Paul, Jonno and Emma.

Each week **four** players are needed to make up the team.

(a) One week, Micky and Katie are chosen for the team and the other two players are chosen at random.

What is the probability that Niles is also in the team?

[3 marks]

Answer _____

(b) Paul is trying to work out the chances he will win a game.

He has the following sets of data available to him.

A How many of the last 5 games he won.

B How many of the last 20 games he won.

C How many of the last 100 games he won.

D How many, of all the games he's ever played, he won.

(b) (i) Give a statistical reason for using option **D**.

[1 mark]

(b) (ii) Give a reason for choosing **one** of the other options.

State which option you choose.

[1 mark]

Option _____

Reason _____

_____

_____

13. June/2022/Paper_8382/2H/No.12

A small factory produces windows.

- Each window has a 4% chance that it is damaged.
- Damaged windows cannot be sold.

On average, **one** window costs £50 to produce and is sold for £300.

(a) Each year, the factory produces 800 windows.

Work out the expected profit made from window sales.

[5 marks]

Answer £ _____

(b) The quality control manager samples the next 5 windows produced to look for damage.

(b) (i) Comment on this data selection method.

[1 mark]

(b) (ii) Calculate the probability that **exactly one** of these 5 windows is damaged.

Assume that the number of damaged windows follows a Binomial distribution.

[3 marks]

Answer _____