5 There are 20 cars in a car park and 3 of the cars are blue.

(a) James wants to draw a pie chart to show this information.

Find the angle of the sector for the blue cars in this pie chart.

..... [2]

(b) One of the 20 cars is picked at random.

Find the probability that this car is **not** blue.

..... [1]

12 Farid spins a three-sided spinner with sides labelled A, B and C.
The probability that the spinner lands on C is 0.35 .
Farid spins the spinner 40 times.

Calculate the number of times he expects the spinner to land on C.

..... [1]

17 The height of each of 200 people is measured.
The table shows the results.

Height (h cm)	$100 < h \leqslant 120$	$120 < h \leqslant 130$	$130 < h \leqslant 150$	$150 < h \leqslant 190$
Frequency	32	55	64	49

Calculate an estimate of the mean height.

..... cm [4]

25 A bag contains 2 green buttons, 5 red buttons and 6 blue buttons.
Two buttons are taken at random from the bag without replacement.

Calculate the probability that the two buttons are different colours.

..... [4]

2 Geetha has a box of toys.
She picks a toy at random from the box.
The probability that she picks a wooden toy is 0.6 .

(a) Work out the probability that she does not pick a wooden toy.

..... [1]

(b) The box contains three types of toys, wooden, plastic or metal.

Type of toy	Wooden	Plastic	Metal
Number of toys		14	14
Probability	0.6		

Complete the table.

[2]

3 **(a)** The table shows information about the marks gained by each of 10 students in a test.

Mark	15	16	17	18	19	20
Frequency	4	1	2	1	0	2

(i) Calculate the range.

..... [1]

(ii) Calculate the mean.

..... [3]

(iii) Find the median.

..... [1]

(iv) Write down the mode.

..... [1]

(b) Paulo's mean mark for 7 homework tasks is 17.
After completing the 8th task, his mean mark is 17.5 .

Calculate Paulo's mark for the 8th task.

..... [3]

22 Bag *A* and bag *B* each contain red counters and blue counters only.
Stephan picks a counter at random from bag *A* and Jen picks a counter at random from bag *B*.

The probability that Stephan picks a red counter is 0.4 .
The probability that Stephan and Jen both pick a red counter is 0.25 .

Find the probability that Stephan and Jen both pick a blue counter.

..... [4]

3 A delivery driver records the number of pizzas she delivers each month for one year.

48	44	39	28	57	22
36	41	54	57	49	52

(a) Complete the stem-and-leaf diagram.

2	
3	
4	
5	

Key: 4 | 8 represents 48 pizzas

[2]

(b) Find the median.

..... [1]

(b) Matilda records the distances that 80 different cars can travel with a full tank of fuel.
The table shows this information.

Distance (d km)	$250 < d \leqslant 300$	$300 < d \leqslant 400$	$400 < d \leqslant 420$	$420 < d \leqslant 450$	$450 < d \leqslant 500$
Frequency	7	13	19	21	20

(i) Write down the class interval that contains the median.

..... $< d \leqslant$ ..... [1]

(ii) Calculate an estimate of the mean.

..... km [4]

(iii) A histogram is drawn to show the information in the table.
The height of the bar for the interval $250 < d \leqslant 300$ is 2.8 cm.

Calculate the height of the bar for each of the following intervals.

$300 < d \leqslant 400$ ..... cm

$400 < d \leqslant 420$ ..... cm

$420 < d \leqslant 450$ ..... cm [3]

(iv) Two of the 80 cars are chosen at random.

Find the probability that, with a full tank of fuel, one of the cars can travel more than 450 km and the other car can travel **not** more than 300 km.

..... [3]

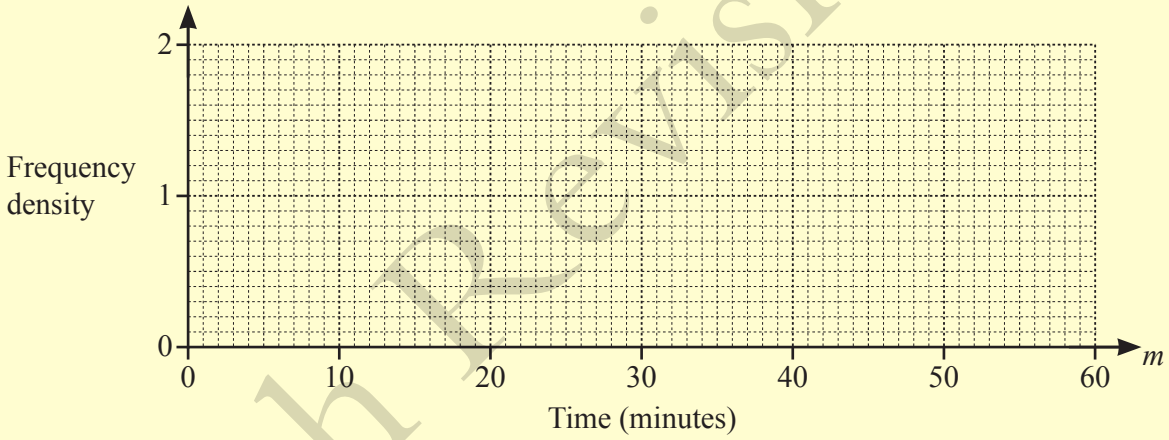
3 **(a)** The table shows the time that each of 40 students takes to travel to school.

Time (m minutes)	$0 < m \leqslant 10$	$10 < m \leqslant 25$	$25 < m \leqslant 40$	$40 < m \leqslant 60$
Frequency	3	18	15	4

(i) Calculate an estimate of the mean.

..... min [4]

(ii) On the grid, draw a histogram to show the information in the table.



[3]

(iii) Two students are selected at random from the 40 students.

Calculate the probability that one student takes more than 25 minutes and the other student takes 10 minutes or less to travel to school.

..... [3]

3 **(a)** Rahul rolls a dice 60 times.
The results are shown in the table.

Score	1	2	3	4	5	6
Frequency	10	6	11	13	14	6

Find the mode, the median and the mean.

mode = ...

median = ...

mean = ... [5]

(b) Sangita measures the speed of each of 100 cars.
The results are shown in the table.

Speed (v km/h)	$20 < v \leqslant 30$	$30 < v \leqslant 50$	$50 < v \leqslant 75$
Frequency	10	72	18

(i) Calculate an estimate of the mean speed.

..... km/h [4]

(ii) Sangita draws a histogram to show the information in the table.
The height of the bar that represents $20 < v \leqslant 30$ is 3 cm.

Calculate the height of each of the other two bars on this histogram.

height of bar for $30 < v \leqslant 50$ ..... cm

height of bar for $50 < v \leqslant 75$ ..... cm [2]

10 Jacinda plays a game with her friend.
She can win, lose or draw the game.
The probability that she wins the game is 0.28 .

(a) Jacinda is twice as likely to draw the game as to lose the game.

Work out the probability that she loses the game.

..... [2]

(b) Jacinda plays the game 150 times.

Find the expected number of times that **she wins**.

..... [1]

9

N	A	M	I	B	I	A

The diagram shows 7 cards.

(a) Amir picks a card at random.

Find the probability that the card shows

(i) the letter H

..... [1]

(ii) the letter B.

..... [1]

(b) Fumika picks one of the 7 cards at random.
She replaces it and picks a second card at random.

Find the probability that both cards show the letter I.

..... [2]

(c) Marcos picks two of the 7 cards at random, **without** replacement.

(i) Find the probability that one card shows the letter I and the other card shows the letter N.

..... [3]

(ii) Find the probability that the two cards show different letters.

..... [3]

(d) Nina picks one of the 7 cards at random without replacement.
She continues picking cards at random without replacement until she picks a card that shows the letter A.

The probability that this occurs when she picks the nth card is $\frac{4}{21}$.

Find the value of n.

$n =$ ..... [2]

5 Each student in a class of 20 students records the number of coins in their pockets.
The table shows the results.

Number of coins	0	1	2	3	4	5	6
Frequency	3	1	7	8	0	0	1

(a) Find the median.

..... [1]

(b) Calculate the mean.

..... [3]

5 A box contains 3 blue pens and 5 red pens.

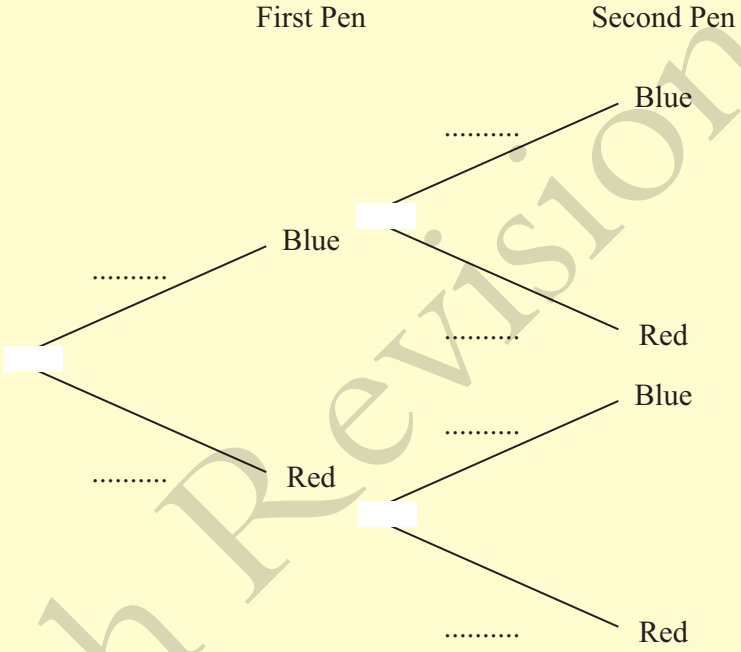
(a) Mia picks a pen from the box at random.

Find the probability that she picks a red pen.

..... [1]

(b) Mia puts the pen back into the box.
She then picks a pen at random and replaces it.
She then picks a second pen at random.

(i) Complete the tree diagram.



[2]

(ii) Find the probability that Mia picks two pens that have the same colour.

..... [3]

(c) Mia now picks 3 of the 8 pens in the box at random **without** replacement.

Find the probability that she picks 2 blue pens and 1 red pen.

..... [3]

8 **(a)** A bag contains 24 coloured beads.
Some are red, some are blue and 10 are yellow.
One bead is picked at random from the bag.

Find the probability that

(i) the bead is yellow

..... [1]

(ii) the bead is not yellow.

..... [1]

(b) Another bag contains 5 green marbles, 6 white marbles and 4 black marbles.
Meera picks 2 marbles at random from the bag, without replacement.

Find the probability that

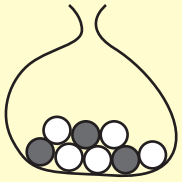
(i) the first marble is black and the second marble is white

..... [2]

(ii) both marbles have different colours.

..... [4]

9



A bag contains 5 white balls and 3 black balls.

(a) **(i)** Marwan picks a ball from the bag at random and then replaces it.

Find the probability that the ball is white.

..... [1]

(ii) Naomi picks a ball from the bag at random and then replaces it.
She repeats this 120 times.

Find the number of times the ball is expected to be white.

..... [1]

(b) Oscar picks a ball from the bag at random.
He replaces it and then picks a second ball from the bag at random.

(i) Find the probability that the balls are the same colour.

..... [3]

(ii) Find the probability that the balls are not the same colour.

..... [1]

(c) Priya picks 3 of the 8 balls from the bag at random without replacement.

Find the probability that she picks two white balls and one black ball.

..... [3]