Maths

Year 9 Foundation

Week beginning 13th July

Complete the summary question booklet and use the hints and tips booklet to help. Answers for all are provided.

Lockdown summary questions - Foundation

Section A – Averages from lists

Q1. Here is a list of numbers.

5 6 1 3 5 5 8 4 2 2

(a) Work out the median.

_____

Answer _____

(b) Work out the mean.

_____

_____

Answer _____

Q2. Six whole numbers have

a median of 10
a mode of 11
a range of 4

Work out a possible set of six numbers.
Write the numbers in order.

_____

_____

Answer _____ , _____ , _____ , _____ , _____ , _____

Q3. In one month, the number of hours of exercise taken by 10 people are

4 7 2 8 6 5 1 82 3 9

Which is the appropriate average to use in this situation?

Tick a box.

Mean ☐ Median ☐ Mode ☐

Give one reason for each of the other two averages as to why they are **not** appropriate.

Reason 1 _____

_____

Reason 2 _____

_____

Q4. The mean of four numbers is 6.
The median is 7.
The mode is 8.

What are the four numbers?

_____

_____

_____

Answer _____ _____ _____ _____

Section B – Mean from frequency tables

Q5. Here is some information about 50 houses.

Number of bedrooms	Number of houses
1	6
2	10
3	22
4	9
5	3
	Total = 50

Show that the mean number of bedrooms is less than 3.

_____

_____

_____

_____

_____

_____

Q6. Class A had a spelling test of ten words.
The table shows their marks.

Class A

Mark	Frequency	
5	4	
6	2	
7	8	
8	10	
9	6	

(a) How many students are in Class A?

_____

Answer _____

(b) Write down the range of the marks.

_____

Answer _____

(c) Show that the mean mark is 7.4

_____

_____

(d) Class B had the same test.

The range of marks for Class B is 6
The mean mark for Class B is 4.3

Compare the marks of Class A and Class B.

Comparison 1 _____

_____

_____

Comparison 2 _____

_____

_____

Q7. A company pays people to visit shops and test customer service.
Paul works for this company.

His fees in October are shown.

Fee (£)	Frequency
8	10
10	18
12	7
15	4
20	1

(a) Calculate his mean fee.

Answer £ _____

(b) Paul says that his modal fee and his median fee are both £10.

Is he correct?
Give reasons and working to show how you decide.

Section C – Mean from grouped frequency tables

Q8. Here is some information about 20 trains leaving a station.

Number of minutes late, *t*	Number of trains	Midpoint	
$0 \leq t < 5$	12		
$5 \leq t < 10$	7		
$10 \leq t < 15$	1		

(a) Work out an estimate of the mean number of minutes late.

Answer _____ minutes

(b) The station manager looks at the information in more detail.

Number of minutes late, *t*	Number of trains
$0 \leq t < 2$	12
$2 \leq t < 4$	0
$4 \leq t < 6$	7
$6 \leq t < 10$	0
$10 \leq t < 12$	1

He works out an estimate of the mean using this information.

How does his estimate compare with the answer to part (a)?

Tick **one** box.

- ☐ Higher than part (a)
- ☐ Same as part (a)
- ☐ Lower than part (a)
- ☐ Not possible to tell

Q9. The table shows information about the distances walked by 120 students on their way to school one week.

Distance, x (miles)	**Frequency**		
$0 < x \leq 5$	20		
$5 < x \leq 10$	48		
$10 < x \leq 15$	30		
$15 < x \leq 20$	22		
	Total = 120		

Work out an estimate for the mean distance.

Answer _____ miles

(Total 3 marks)

Q10. The table shows information about the times for 10 people to complete a task.

Time, t (minutes)	**Frequency**
$0 < t \leq 20$	1
$20 < t \leq 40$	6
$40 < t \leq 60$	3

These statements are about the mean and range of the actual times.

Tick the correct box for each statement.	**True**	**False**
The mean could be less than 20 minutes	☐	☐
The mean could be more than 40 minutes	☐	☐
The mean could be less than 40 minutes	☐	☐
The range could be more than 40 minutes	☐	☐
The range could be less than 40 minutes	☐	☐
The range could be more than 60 minutes	☐	☐

Section C – Two way tables

Q11. The table shows the number of desktop computers and laptops in 50 households.

Desktop computers

Laptops	**0**	**1**	**2**	**3**
0	0	6	1	0
1	5	10	4	4
2	1	8	5	0
3	3	2	1	0

(a) How many households have two laptops?

Answer _____

(b) How many households have more laptops than desktop computers?

Answer _____

Q12. 20 students choose a sport.

Boy	Tennis
Girl	Basketball
Girl	Tennis
Boy	Football
Boy	Tennis
Girl	Football
Boy	Tennis
Boy	Football
Boy	Basketball
Girl	Tennis

Girl	Football
Boy	Basketball
Girl	Tennis
Girl	Tennis
Girl	Tennis
Boy	Football
Boy	Football
Girl	Basketball
Boy	Basketball
Boy	Football

(a) How many boys choose tennis?

Answer _____

(b) Put the information into the two-way table.
Remember to complete the totals.

	Tennis	Basketball	Football	Total
Boys				
Girls				
Total				**20**

Q13. (a) Here is information about animals in a rescue centre.

- Half of the dogs are male.
- 25% of the rabbits are female.
- There are 20 more males than females altogether.

Complete the two-way table.

	Dog	Cat	Rabbit	Total
Male				
Female				
Total	42	18	20	80

(b) 42 of the 80 animals are dogs.

What percentage of the animals are dogs?

_____

_____

_____

_____

Answer _____ %

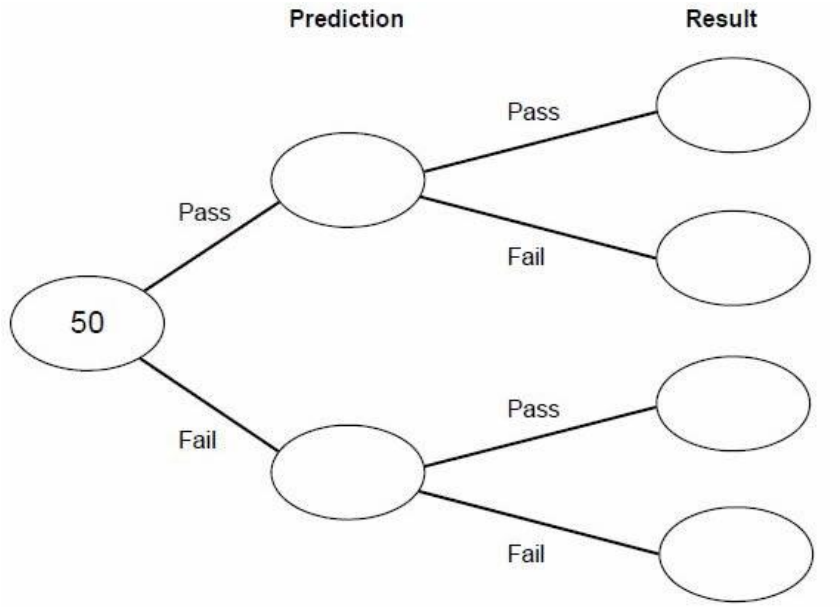
Section E – Frequency trees

Q14. 50 people took a test.

Before the test, they predicted whether they would pass or fail.

30 people predicted they would pass.
26 of the people who predicted they would pass did pass.
37 people passed altogether.

Complete the frequency tree.

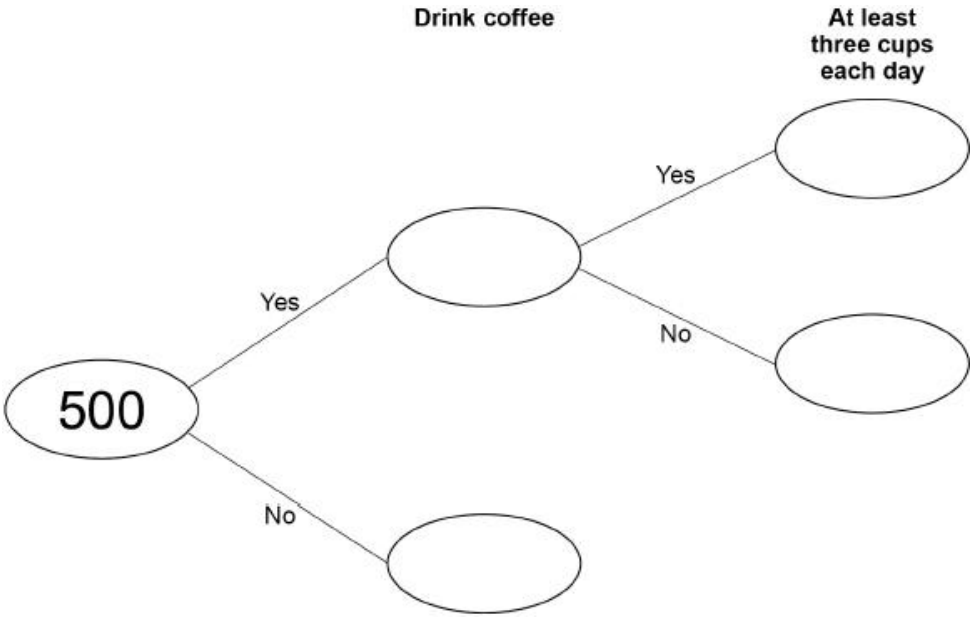


Q15. 500 people are asked if they drink coffee.

$\frac{9}{10}$ say Yes.

20% of the people who say Yes drink at least three cups each day.

(a) Complete the frequency tree.



(b) What fraction of the 500 people drink at least three cups of coffee each day?

Give your answer in its simplest form.

_____

_____

Answer _____

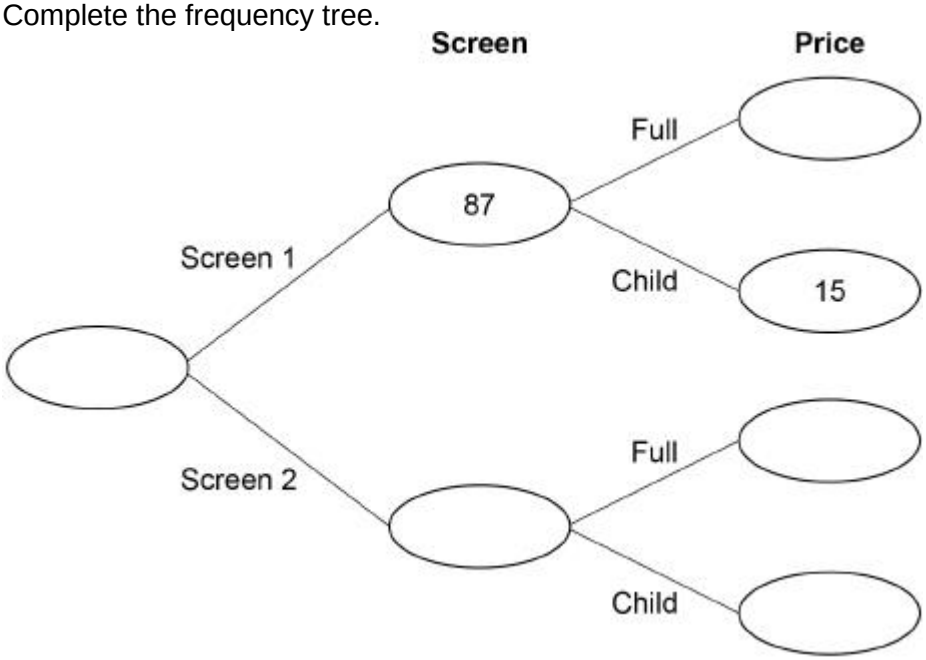
Q16. At a cinema, films are shown on Screen 1 and Screen 2

Customers pay full price or child price.

There are three times as many customers in Screen 2 as Screen 1

68 customers paid child price.

Complete the frequency tree.

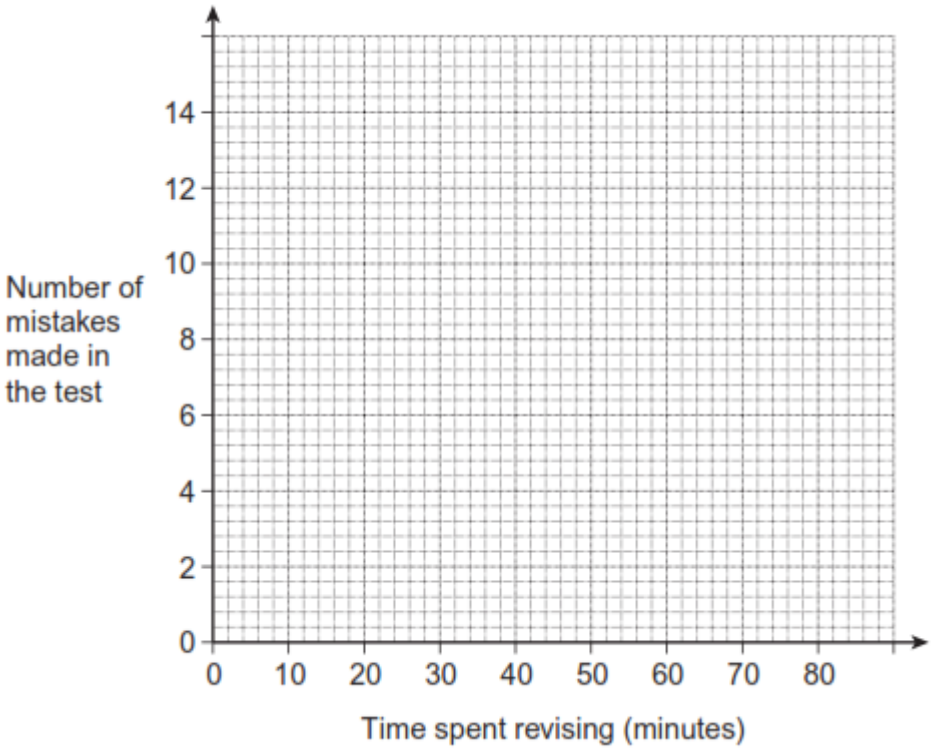


Section F – Scatter graphs

Q17. Six pupils took a spelling test.

Time spent revising (minutes)	10	15	35	40	45	50
Number of mistakes made in the test	14	11	5	5	2	3

(a) Plot the data on the scatter diagram.



(b) A pupil revised for 25 minutes.

Use a line of best fit to estimate the number of mistakes he made.

Answer _____

(c) Another pupil in the class revised for 75 minutes.

Did she make any mistakes?

Tick a box.

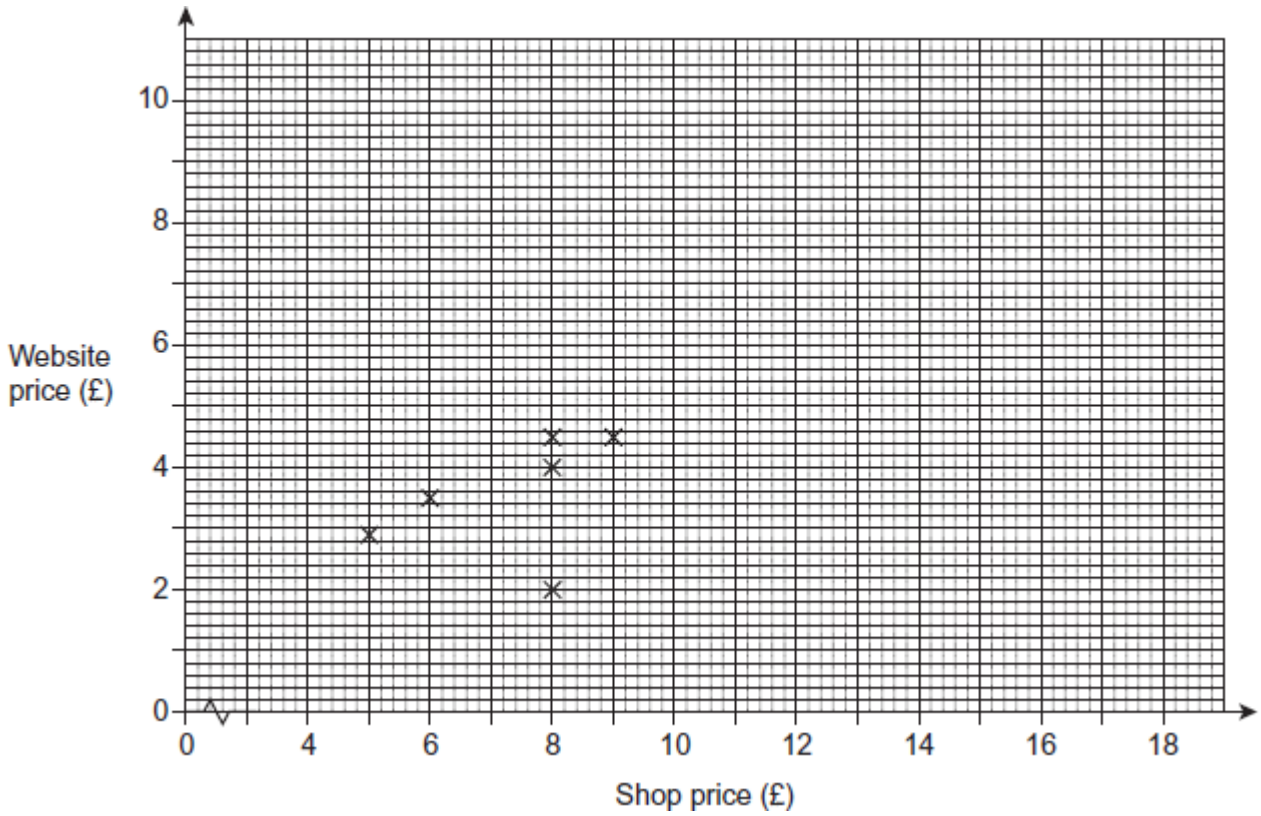
Yes ☐ No ☐ Cannot tell ☐

Q18. Here are the shop and website prices of some books.

Shop price (£)	5	6	8	8	8	9	10	13	13	17
Website price (£)	2.90	3.50	2	4	4.50	4.50	5.40	7.20	8.00	9.80

(a) The first six points have been plotted on this scatter diagram.

Complete the scatter diagram



(b) Describe the type of correlation shown on the scatter diagram.

_____

(c) A book has a shop price of £ 15.

Estimate its website price.
You **must** show your working.

£ _____

(d) The shop manager thinks that one of the prices on the website is incorrect.

Circle this point on the graph.
Give a reason for your answer.

_____

_____

Q19. A student draws three scatter diagrams. She draws a line of best fit on each one.

Diagram A

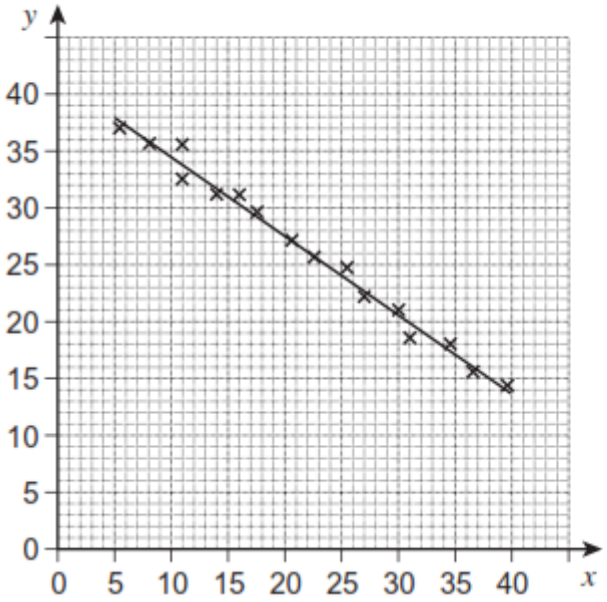


Diagram B

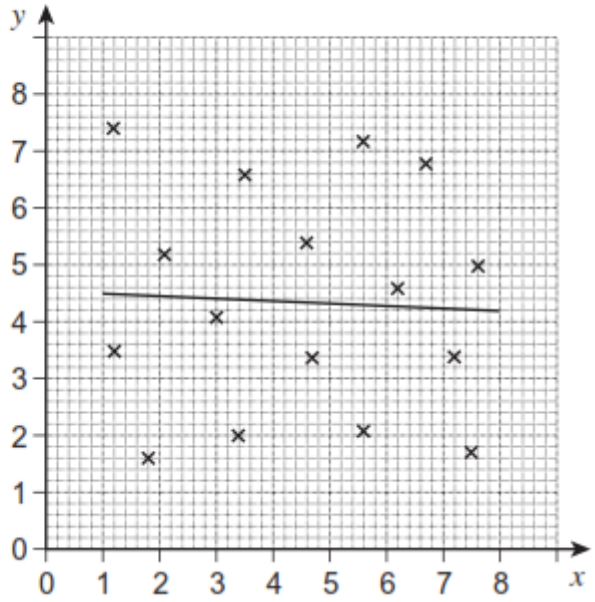
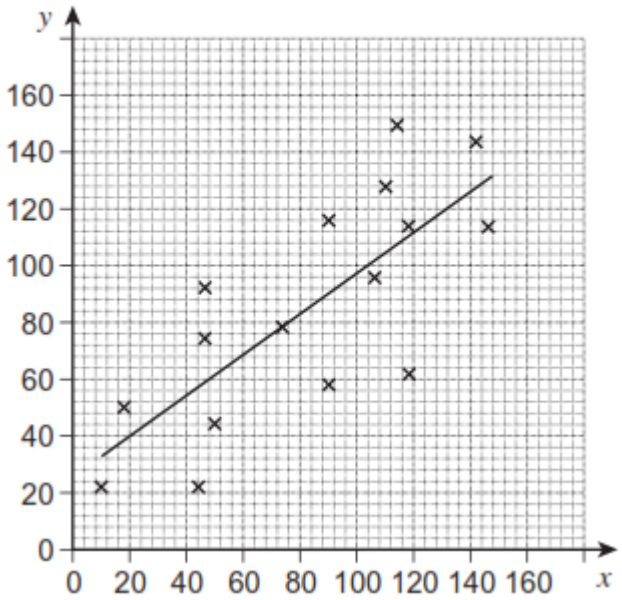


Diagram C



(a) Which diagram shows the strongest correlation?
Circle your answer.

A B C

(b) Which line of best fit should **not** have been drawn?

Give a reason for your answer.

_____

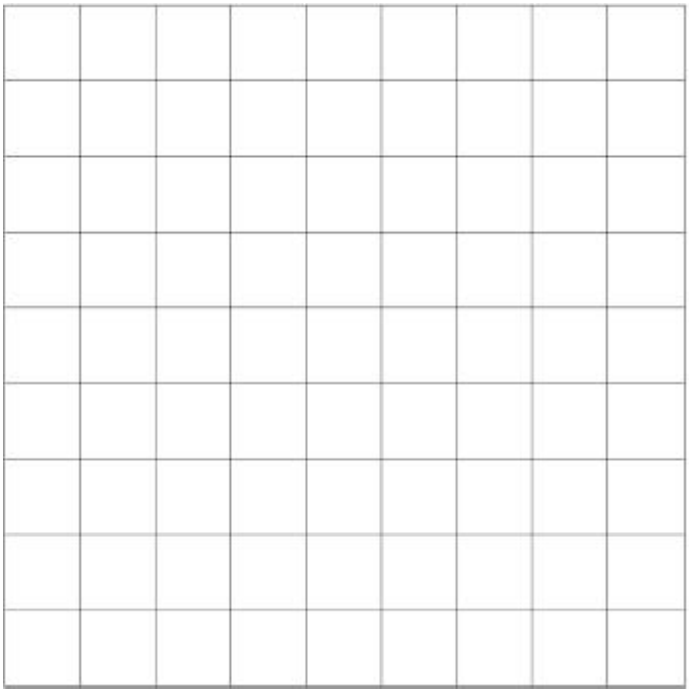
_____

Section G – Bar charts

Q20. The table shows information about the birds in a garden.

Bird	Number
Robin	2
Sparrow	5
Wren	3
Lark	1

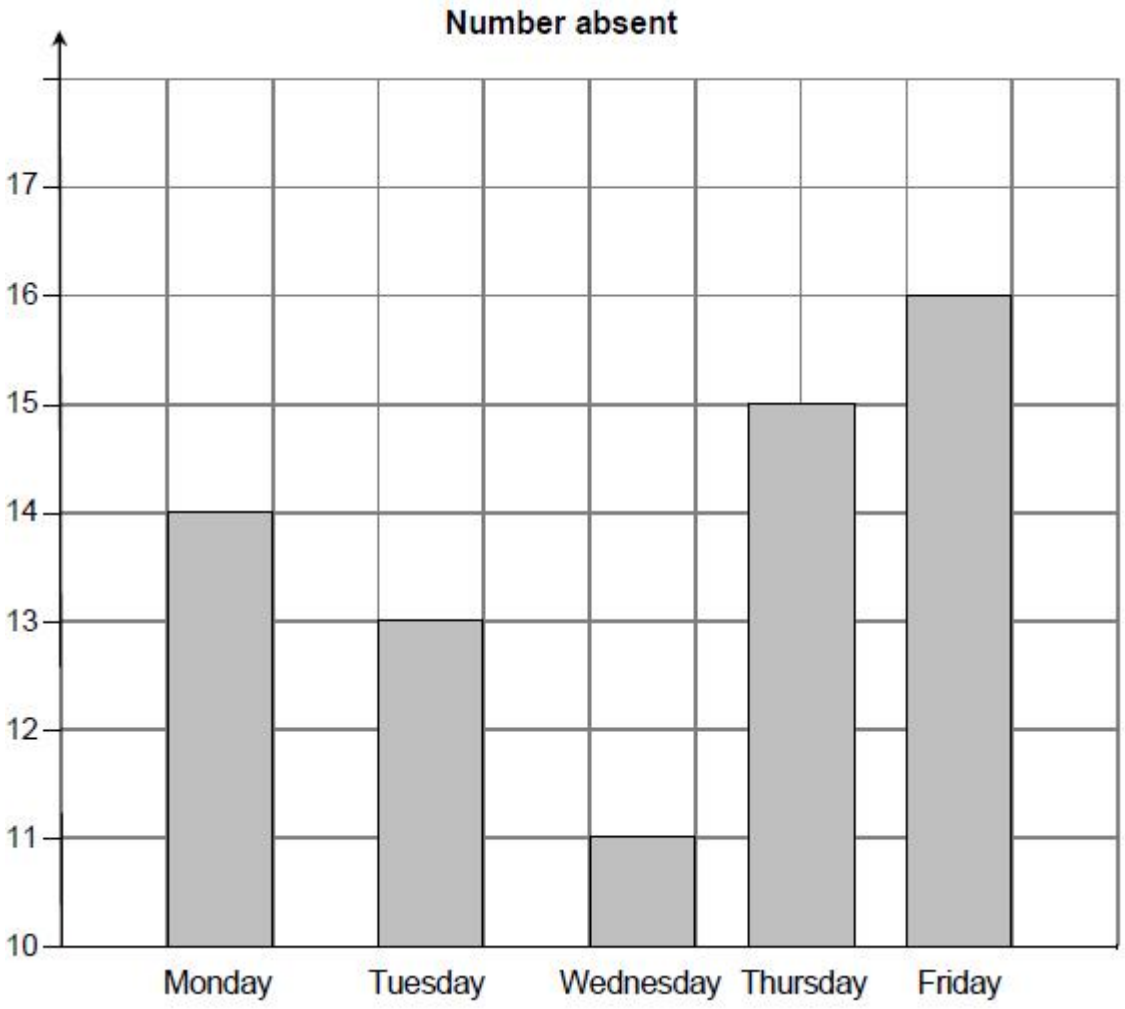
Draw a bar chart to show the information.



Q21. The table shows the number of Year 11 students who were absent in one week.

	Monday	Tuesday	Wednesday	Thursday	Friday
Number absent	14	13	11	15	16

Jack uses this information to draw a bar chart.



Write down **two** mistakes that he has made.

Mistake 1 _____

_____

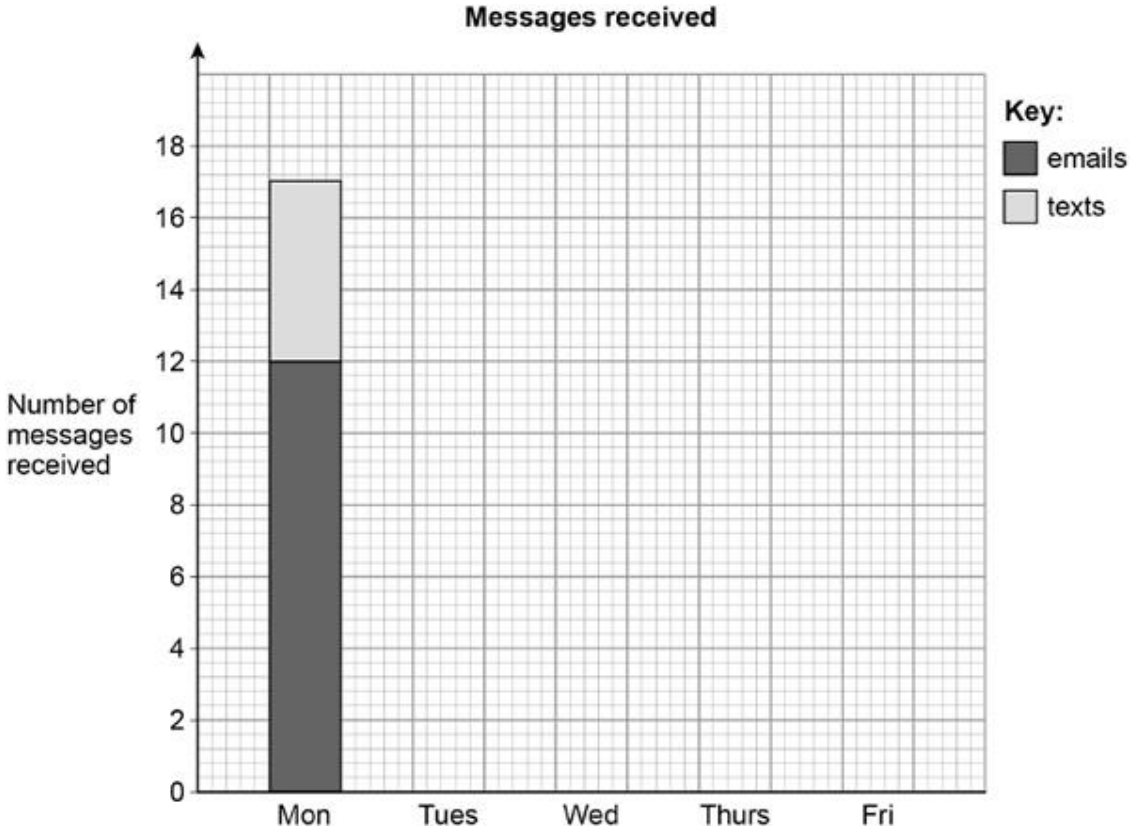
Mistake 2 _____

_____

Q22. The table shows the number of messages Sam received each day for five days.

	Messages	
	Number of emails	**Number of texts**
Monday	12	5
Tuesday	8	6
Wednesday	10	3
Thursday	6	6
Friday	12	4

(a) Sam draws a composite bar chart to represent the data.
He has drawn the bar for Monday.



Complete the chart.

(b) In total, what fraction of the messages were emails?

Give your answer in its simplest form.

Answer _____

Section H – Pictograms

Q23. A club rents films. These were the films rented on **Monday**.

Films rented on Monday

Comedy	12
Thriller	6
Romance	9
	Total = 27

(a) Draw a pictogram for this data.

Films rented on Monday

Key:  represents 4 films.

Comedy	
Thriller	
Romance	

(b) This pictogram represents the films rented on Tuesday.

Films rented on Tuesday

Key:  to represents 2 films

Comedy	
Thriller	
Romance	

The club manager says,

> "Looking at the total number of films rented on **Monday and Tuesday**, half of them were Comedy."

Is he correct?
You **must** show your working.

_____

_____

_____

Q24. Gemma has four groups of friends on a social media site. The table shows the number of friends in each group.

Group	Number of friends
Family	8
Netball	8
School	26
Guides	11

(a) Which group is the mode?

Answer _____

(b) Gemma wants a pictogram to show the information.
She has drawn the first two rows.

Complete the pictogram.
Remember to complete the key.

Key: ◯ represents _____ friends

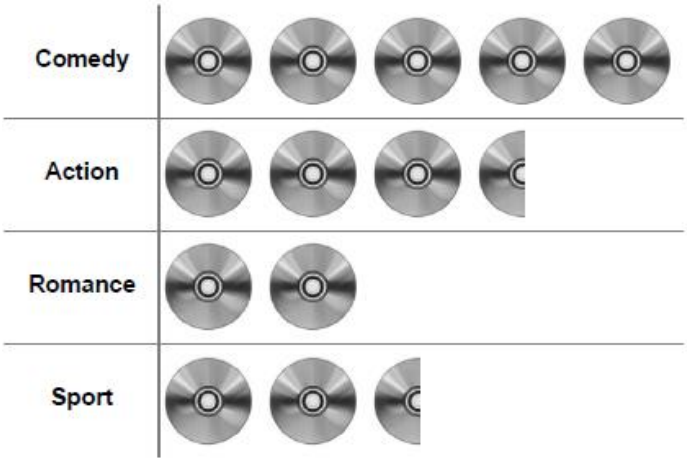
Family	◯ ◯
Netball	◯ ◯
School	
Guides	

Q25. (a)

How many DVDs do you get for £35?

Answer _____

(b) The pictogram shows some information about DVDs.
The key is missing.



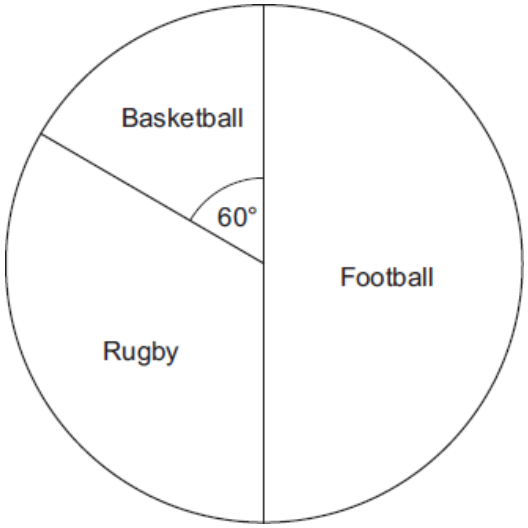
The total number of DVDs is 260

Work out the number of **Sport** DVDs.

Answer _____

Section I – Pie charts

Q26. The pie chart shows the sports played by 30 boys.



(a) How many boys play Football?

_____

Answer _____

(b) How many boys play Rugby?

_____

_____

Answer _____

Q27. A car park is open from 9 am to 6 pm.

(a) (i) 80 cars enter between 9 am and 10 am.
One-quarter of these cars are silver.

How many silver cars enter between 9 am and 10 am?

_____

Answer _____

(ii) 115 cars enter between 10 am and 11 am.
Kim says, "Exactly one-quarter of these cars are silver."

Show that she is wrong.

_____

_____

(b) A data logging machine counts cars entering and leaving the car park.

Hour ending at	Cars entering	Cars leaving
10 am	80	5
11 am	115	25
12 noon	75	40
1 pm	35	35
2 pm	50	50
3 pm	40	45
4 pm	20	65
5 pm	10	115
6 pm	5	30

(i) The car park is empty at 9 am.

How many cars are in the car park at 10 am?

_____

Answer _____

(ii) Barriers stop cars entering when the car park is full.
The car park is full at 12 noon.

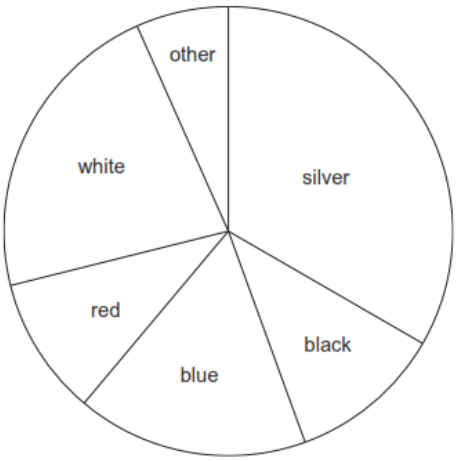
How many cars are in the car park when it is full?

_____

_____

Answer _____

(c) The pie chart shows information about the colours of the cars in the car park one day.



Complete the sentences.

(i) There are twice as many _____ cars as black cars.

(ii) $\frac{1}{3}$ of the cars are _____

(d) Are there any purple cars in the car park on that day?

Tick a box.

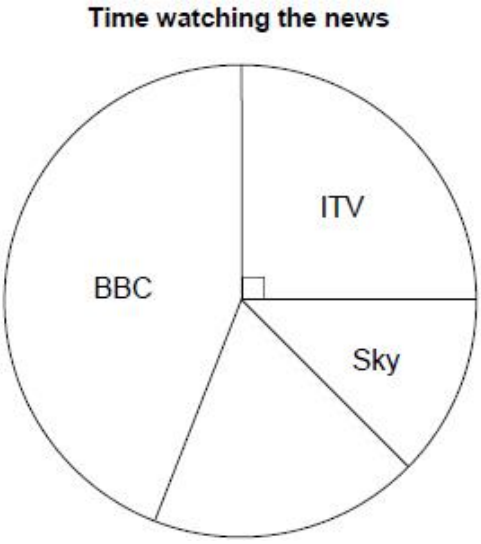
☐ Yes ☐ No ☐ Cannot tell

Give a reason for your answer.

_____

_____

Q28. Jack draws a pie chart to represent his time watching the news in January.
Altogether he watches 18 hours of news.



(a) How many hours did he spend watching ITV news?

_____

_____

Answer _____ hours

(b) Write down **one** criticism of his pie chart.

_____

_____

(c) In February he also watches 18 hours of news.
He watches 10 hours on the BBC.

Jack says,

"This is more than in January because the pie chart shows I watched less than 9 hours of BBC news."

Comment on his statement.

_____

_____

(1)

(d) In February he watches 2 hours of news on Sky.

Jack says,

"If I draw a pie chart for February the angle for Sky news will **not** be a whole number of degrees. This is because $\frac{2}{18}$ is **not** a terminating decimal."

Is his statement correct?
Tick a box.

☐ Correct ☐ Not correct

You **must** show your working.

_____

_____

_____

Section J – Basic probability

Q29. A music app has a shuffle play function.

This means that songs are played in a random order **without repeat**.

(a) Ruth puts 10 songs on shuffle play.
One of them is her favourite song.

Write down the probability that her favourite song plays first.

_____

Answer _____

(b) Ted puts songs A, B and C on shuffle play.

List all the possible orders of songs A, B and C.
One has been done for you.

A B C

Q30. (a) List **all** the factors of 30.

_____

_____

Answer _____

(b) A factor of 30 is chosen at random.
What is the probability that it is a 2-digit number?

_____

_____

Answer _____

Q31. A number is picked at random from the first four **prime** numbers.

A number is picked at random from the first four **square** numbers.
The two numbers are added to get a score.

(a) Complete the table.

		Square numbers			
	+	**1**	**4**	**9**	
Prime numbers	**2**				
	3			12	
	7				

(b) What is the probability that the score is a **prime** number?

Answer _____

Answers to check work

Q1. (a) 4.5 (b) 4.1

Q2. 7, 8, 9, 11, 11, 11
7, 7, 9, 11, 11, 11
7, 9, 9, 11, 11, 11

Q3. Median ticked
and
a valid reason for not using mode (eg there is no mode)
and
a valid reason for not using mean (eg 82 will affect the mean disproportionately)

Q4. 2 6 8 8 (in any order)

Q5. 2.86

Q6. (a) 30
(b) 4
(c) Answer in question
(d) Marks for Class B are more spread out
On average Class A marks higher than Class B

Q7. (a) 10.60
(b) Mode = 10 as it is the value occurring most often
Median is the 20th (or 20.5th) unless contradicts with conclusion
(c) One similarity - *eg same range, same mode, same values for data, same frequency for £15*
One difference -*Different mean, different median, Shelley 50 visits/fees, Paul 40*

Q8. (a) 4.75
(b) Lower than part (a)

Q9. 9.75 or $9\frac{3}{4}$

Q10. False
True
True
True
True
False

Q11. (a) 14
(b) 20

Q12. (a) 3
(b)

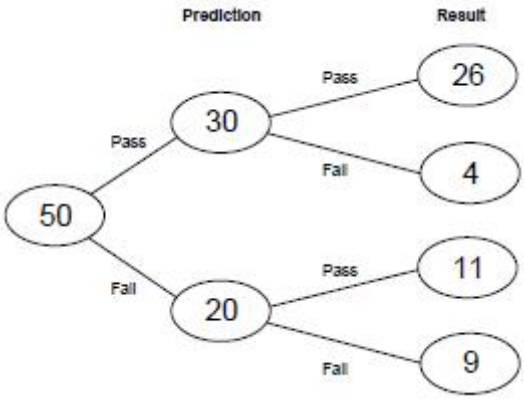
	Tennis	**Basketball**	**Football**	**Total**
Boys	3	3	5	11
Girls	5	2	2	9
Total	8	5	7	20

Q13. (a)

	D	**C**	**R**	**Total**
M	21	14	15	50
F	21	4	5	30

(b) 52.5

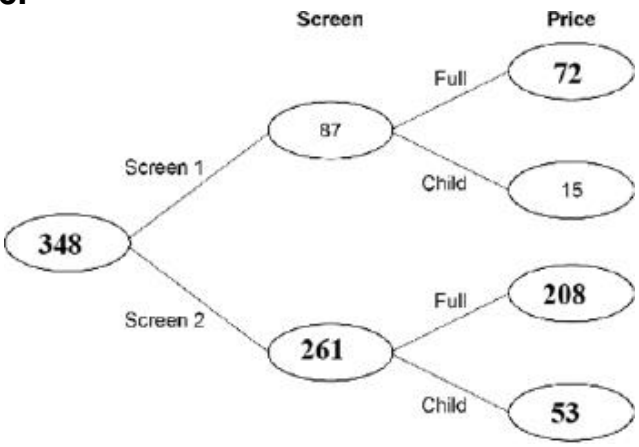
Q14.



Q15. (a) 450 in Drink coffee Yes
50 in Drink coffee No
90 in At least three cups Yes
360 in At least three cups No

(b) $\frac{9}{50}$

Q16.



Q17. (a) All 6 points correct ($\pm \frac{1}{2}$ sq)
(b) Draws a suitable line of best fit
Answer appropriate to their line of best fit
(c) Cannot tell

Q18. (a) All 4 points correctly plotted
(b) Positive
(c) Between 8.50 and 9
(d) Point (8,2) circled
Not close to other data

Q19. (a) A
(b) B and says there is no correlation

Q20. Linear scale starting at 0 and increasing in 1s on vertical axis
Vertical axis labelled frequency or f or number
Title given or horizontal axis labelled (types of) bird(s)
Bars labelled with four bird names (allow R, S, W, L)
Four bars with equal widths
Equal gaps or no gaps between four bars
All heights correct

Q21. Any two from:
(Vertical scale) does not start at 0 or incorrect height bars or vertical scale is incorrect
Gaps (between bars not equal)

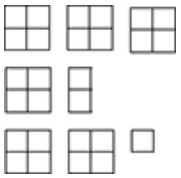
No label(s) (on vertical scale)
(frequency)

Q22. (a) All composite bars with correct widths and heights as

Tuesday 8 and 6
Wednesday 10 and 3
Thursday 6 and 6
Friday 12 and 4

(b) $\frac{2}{3}$

Q23. (a)



(b) 44 and 22 and Yes or 22 and 22 and Yes

Q24. (a) School

(b)

Key: ○ represents 4 friends

Family	○○
Netball	○○
School	○○○○○○◐
Guides	○○◔

Q25. (a) 10

(b) 50

Q26. (a) 15

(b) 10

Q27. (a) (i) 20

(ii) As 115 divided by 4 does not give a whole number

(b) (i) 75

(ii) 200

(c) (i) White or W

(ii) Silver or S or "black or white"

(d) Ticks Cannot Tell and explains that they may be in the 'other' category

Q28. (a) 4.5

(b) *eg One sector not labelled or Condone angles missing*

(c) *eg True statement as 9 hours is half the pie chart and BBC is less than half*

(d) Not correct and 40

or Not correct and 18 is a factor of 360

Q29. (a) $\frac{1}{10}$ or 0.1(0) or 10%

(b)

ABC BAC CAB

ACB BCA CBA

Q30. (a) 1, 2, 3, 5, 6, 10, 15, 30

(b) $\frac{3}{8}$

Q31. (a)

+	1	4	9	**16**
2	**3**	**6**	**11**	**18**
3	**4**	**7**	12	**19**
5	**6**	**9**	**14**	**21**
7	**8**	**11**	**16**	**23**

(b) $\frac{6}{16}$ or $\frac{3}{8}$

Lockdown summary questions - Foundation

Section A – Averages from lists

Q1. Here is a list of numbers.

5 6 1 3 5 5 8 4 2 2

(a) Work out the median.

1 2 2 3 4 5 5 8 6 8

Answer 4.5

(b) Work out the mean.

add numbers = 41

41 ÷ 10

Answer 4.1

Q2. Six whole numbers have

a median of 10
a mode of 11
a range of 4

eg. 7 8 9 11 11 11

(9 + 11) ÷ 2 = 10

Work out a possible set of six numbers.
Write the numbers in order.

Answer _____, _____, _____, _____, _____, _____

Q3. In one month, the number of hours of exercise taken by 10 people are

4 7 2 8 6 5 1 82 3 9

Which is the appropriate average to use in this situation?

Tick a box.

Mean ☐ Median ☑ Mode ☐

Give one reason for each of the other two averages as to why they are **not** appropriate.

Reason 1 82 will skew the mean

Reason 2 No mode

Q4. The mean of four numbers is 6.
The median is 7.
The mode is 8.

What are the four numbers?

2 6 8 8 (median = 7)

Total = 6 × 4 = 24

6 + 8 + 8 = 22

2 is final number

Answer 2 6 8 8

Section B – Mean from frequency tables

Q5. Here is some information about 50 houses.

Number of bedrooms	Number of houses	f × x
1	6	6
2	10	20
3	22	66
4	9	36
5	3	15
	Total = 50	143

Show that the mean number of bedrooms is less than 3.

143 ÷ 50 = 2.86

Q6. Class A had a spelling test of ten words.
The table shows their marks.

Class A

Mark	Frequency	f x x
5	4	20
6	2	12
7	8	56
8	10	80
9	6	54
	30	222

(a) How many students are in Class A?

add frequency colum

Answer 30

(b) Write down the range of the marks.

9 - 5 = 4

Answer 4

(c) Show that the mean mark is 7.4

222 ÷ 30 = 7.4

(d) Class B had the same test.

The range of marks for Class B is 6
The mean mark for Class B is 4.3

Compare the marks of Class A and Class B.

Comparison 1 Class B less consistent (range was larger)

Comparison 2 Class B did less well on average (mean 4.3 vs 7.4)

Q7. A company pays people to visit shops and test customer service.
Paul works for this company.

His fees in October are shown.

Fee (£)	Frequency	fx
8	10	80
10	18	180
12	7	84
15	4	60
20	1	20
	40	424

(a) Calculate his mean fee.

$\frac{424}{40}$ =

Answer £ 10.60 ← don't forget the zero

(b) Paul says that his modal fee and his median fee are both £10.

Is he correct?
Give reasons and working to show how you decide.

mode = £10 (largest group)

20th person is in £10 group

middle

Paul is correct

Section C – Mean from grouped frequency tables

Q8. Here is some information about 20 trains leaving a station.

Number of minutes late, t	Number of trains (frequency)	Midpoint	fx mid
$0 \le t < 5$	12	2.5	30
$5 \le t < 10$	7	7.5	52.5
$10 \le t < 15$	1	12.5	12.5
	20		95

(a) Work out an estimate of the mean number of minutes late.

$\frac{95}{20} = 4.75$

Answer 4.75 minutes

(b) The station manager looks at the information in more detail.

Number of minutes late, t	Number of trains (frequency)	midpoint	fx mid
$0 \le t < 2$	12	1	12
$2 \le t < 4$	0	3	0
$4 \le t < 6$	7	5	35
$6 \le t < 10$	0	8	0
$10 \le t < 12$	1	11	11
			58

He works out an estimate of the mean using this information.

How does his estimate compare with the answer to part (a)?

Tick **one** box.

$58 \div 20 = 2.9$

- ☐ Higher than part (a)
- ☐ Same as part (a)
- ☑ Lower than part (a) → dont need working - see most trains are in the 0 → 2 group, must be lower
- ☐ Not possible to tell

Q9. The table shows information about the distances walked by 120 students on their way to school one week.

Distance, x (miles)	Frequency	midpoint	fx mid
$0 < x \le 5$	20	2.5	50
$5 < x \le 10$	48	7.5	360
$10 < x \le 15$	30	12.5	375
$15 < x \le 20$	22	17.5	385
	Total = 120		1170

Work out an estimate for the mean distance.

$\frac{1170}{120} = 9.75$

Answer _____ miles

(Total 3 marks)

Q10. The table shows information about the times for 10 people to complete a task.

Time, t (minutes)	Frequency
$0 < t \le 20$	1
$20 < t \le 40$	6
$40 < t \le 60$	3

These statements are about the mean and range of the actual times.

Tick the correct box for each statement.	True	False
The mean could be less than 20 minutes	☐	☑
The mean could be more than 40 minutes	☑	☐
The mean could be less than 40 minutes	☑	☐
The range could be more than 40 minutes	☑	☐
The range could be less than 40 minutes	☑	☐
The range could be more than 60 minutes	☐	☑

Section C – Two way tables

Q11. The table shows the number of desktop computers and laptops in 50 households.

Laptops \ Desktop computers	0	1	2	3
0	0	6	1	0
1	5	10	4	4
2	4	8	5	0
3	3	2	1	0

(a) How many households have two laptops?

1 + 8 + 5 + 0

Answer 14

(b) How many households have more laptops than desktop computers?

5 + 4 + 8 + 3 + 2 + 1

Answer 20

Q12. 20 students choose a sport.

Boy	Tennis
Girl	Basketball
Girl	Tennis
Boy	Football
Boy	Tennis
Girl	Football
Boy	Tennis
Boy	Football
Boy	Basketball
Girl	Tennis

Girl	Football
Boy	Basketball
Girl	Tennis
Girl	Tennis
Girl	Tennis
Boy	Football
Boy	Football
Girl	Basketball
Boy	Basketball
Boy	Football

(a) How many boys choose tennis?

Answer 3

(b) Put the information into the two-way table.
Remember to complete the totals.

	Tennis	Basketball	Football	Total
Boys	3	3	5	11
Girls	5	2	2	9
Total	8	5	7	20

Q13. (a) Here is information about animals in a rescue centre.

- Half of the dogs are male.
- 25% of the rabbits are female. (1/4)
- There are 20 more males than females altogether.

Complete the two-way table.

	Dog	Cat	Rabbit	Total
Male	21	14	15	50
Female	21	4	5	30
Total	42	18	20	80

(b) 42 of the 80 animals are dogs.

What percentage of the animals are dogs?

$\frac{42}{80} \times 100 = 52.5\%$

Answer 52.5 %

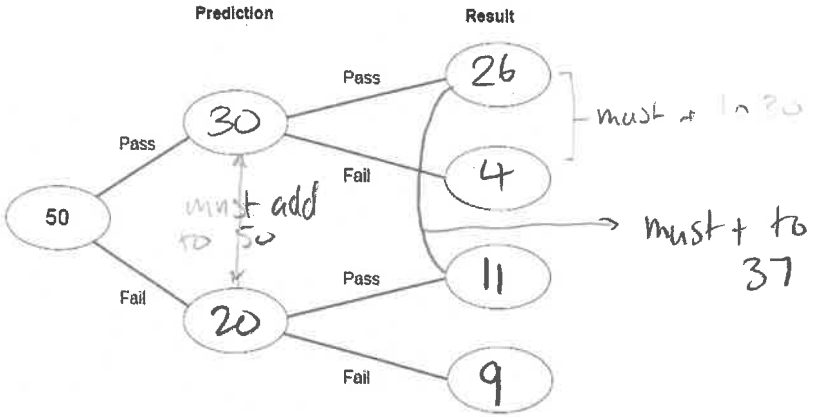
Section E – Frequency trees

Q14. 50 people took a test.

Before the test, they predicted whether they would pass or fail.

30 people predicted they would pass.
26 of the people who predicted they would pass did pass.
37 people passed altogether.

Complete the frequency tree.

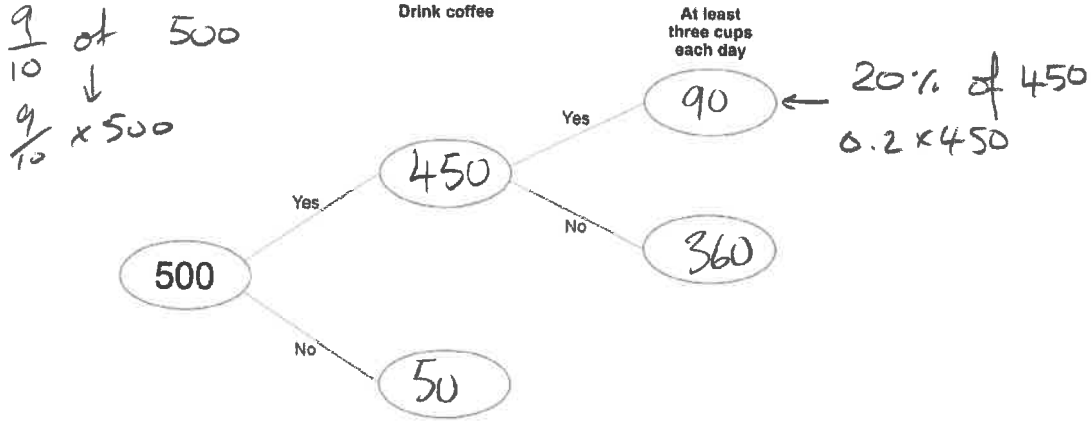


Q15. 500 people are asked if they drink coffee.

$\frac{9}{10}$ say Yes.

20% of the people who say Yes drink at least three cups each day.

(a) Complete the frequency tree.



(b) What fraction of the 500 people drink at least three cups of coffee each day?

Give your answer in its simplest form. $\frac{90}{500} = \frac{9}{50}$

Answer _____

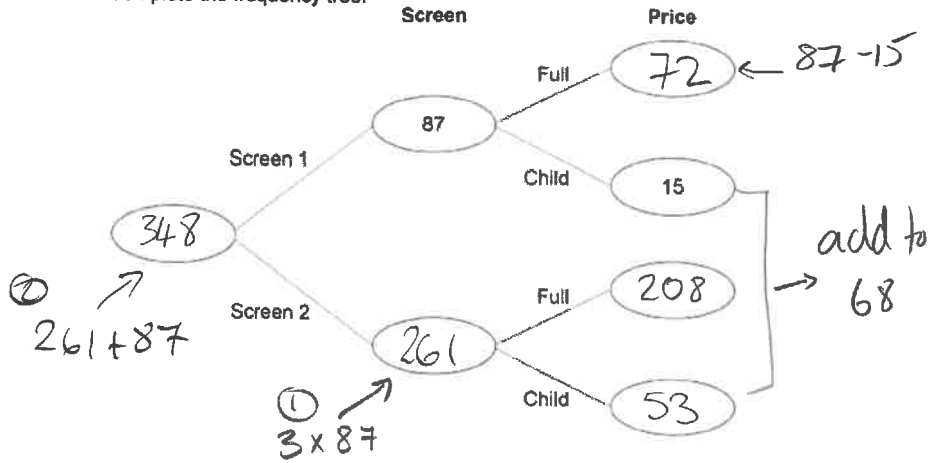
Q16. At a cinema, films are shown on Screen 1 and Screen 2

Customers pay full price or child price.

There are three times as many customers in Screen 2 as Screen 1

68 customers paid child price.

Complete the frequency tree.

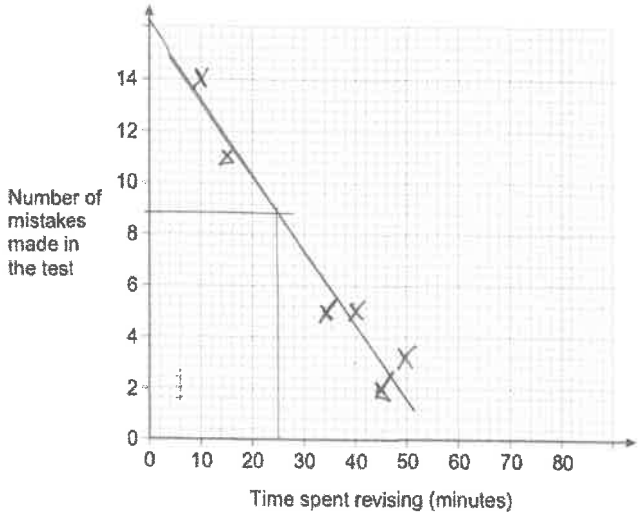


Section F – Scatter graphs

Q17. Six pupils took a spelling test.

Time spent revising (minutes)	10	15	35	40	45	50
Number of mistakes made in the test	14	11	5	5	2	3

(a) Plot the data on the scatter diagram.



(b) A pupil revised for 25 minutes.

Use a line of best fit to estimate the number of mistakes he made.

Answer 9

(c) Another pupil in the class revised for 75 minutes.

Did she make any mistakes?

Tick a box.

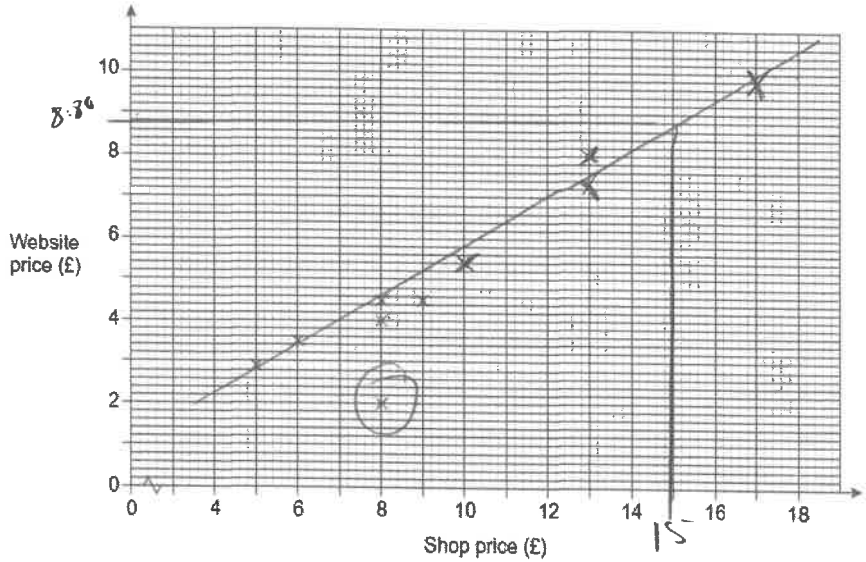
Yes ☐ No ☐ Cannot tell ☑

Q18. Here are the shop and website prices of some books.

Shop price (£)	5	6	8	8	8	9	10	13	13	17
Website price (£)	2.90	3.50	2	4	4.50	4.50	5.40	7.20	8.00	9.80

(a) The first six points have been plotted on this scatter diagram.

Complete the scatter diagram



(b) Describe the type of correlation shown on the scatter diagram.

(Strong) positive

(c) A book has a shop price of £ 15.

Estimate its website price.
You **must** show your working. → draw Line of best fit + working lines

£ 8·80

(d) The shop manager thinks that one of the prices on the website is incorrect.

Circle this point on the graph.
Give a reason for your answer.

Long way from Line of best fit

Q19. A student draws three scatter diagrams. She draws a line of best fit on each one.

Diagram A

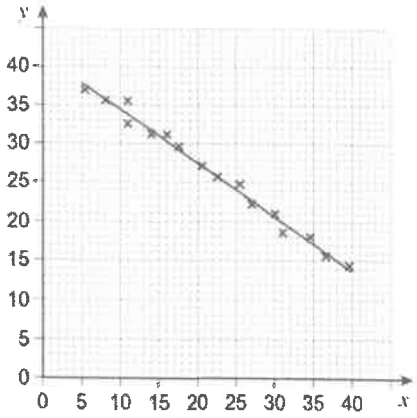


Diagram B

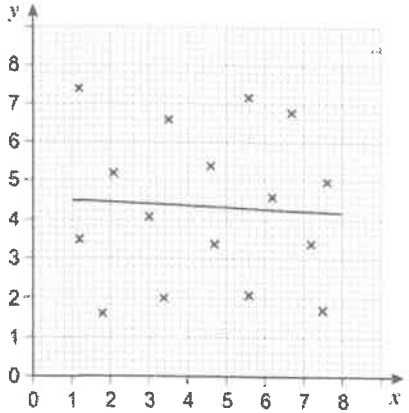
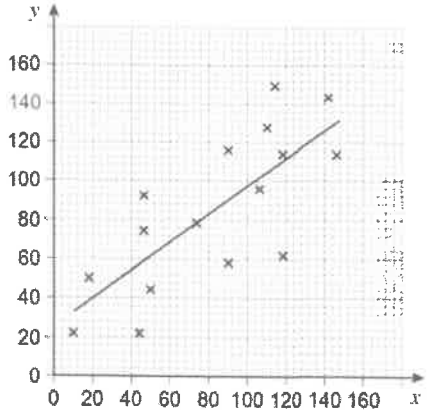


Diagram C



(a) Which diagram shows the strongest correlation?
Circle your answer.

(A) B C

(b) Which line of best fit should **not** have been drawn?

Give a reason for your answer.

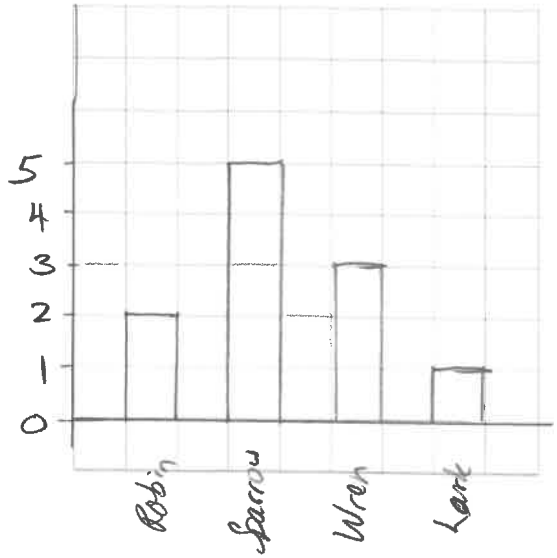
B - No correlation

Section G – Bar charts

Q20. The table shows information about the birds in a garden.

Bird	Number
Robin	2
Sparrow	5
Wren	3
Lark	1

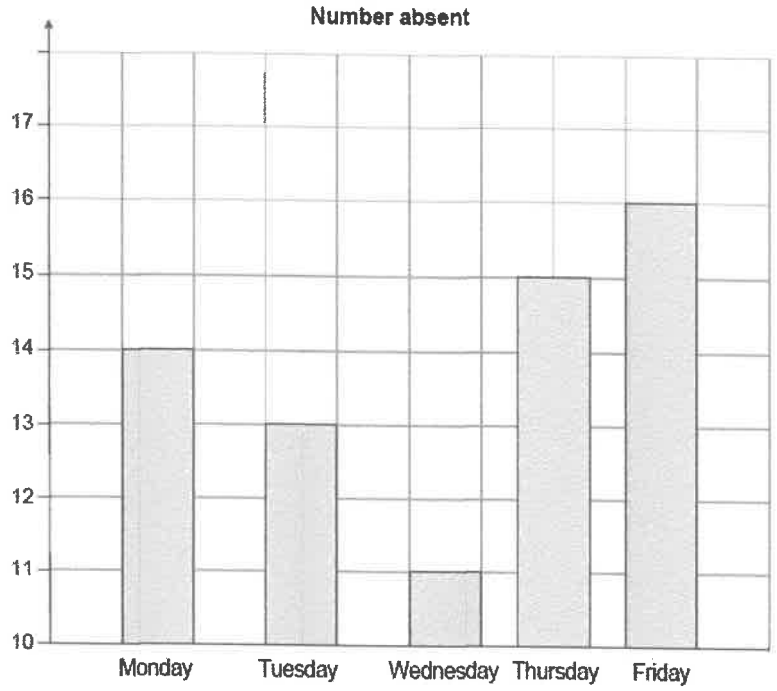
Draw a bar chart to show the information.



Q21. The table shows the number of Year 11 students who were absent in one week.

	Monday	Tuesday	Wednesday	Thursday	Friday
Number absent	14	13	11	15	16

Jack uses this information to draw a bar chart.



Write down **two** mistakes that he has made.

Mistake 1 uneven gaps

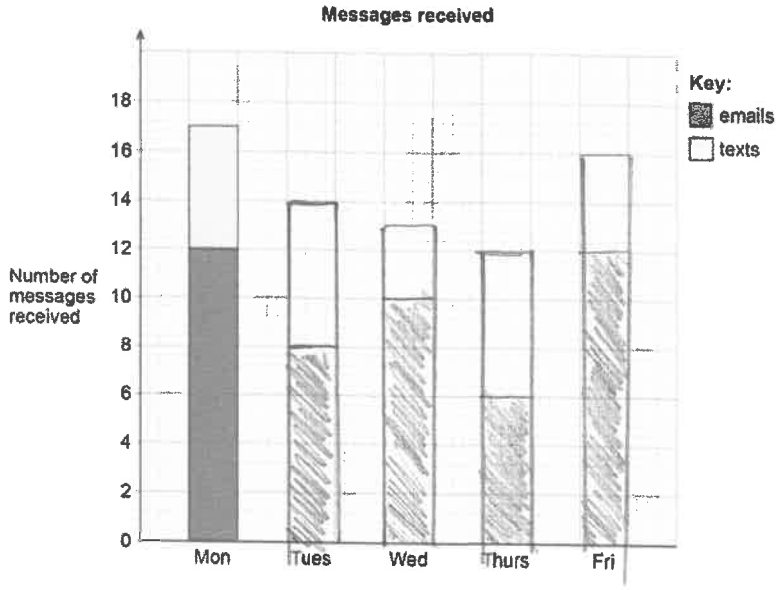
Mistake 2 vertical axis (y-axis) not labelled

vertical (y) axis doesn't start at 0

Q22. The table shows the number of messages Sam received each day for five days.

	Messages	
	Number of emails	Number of texts
Monday	12	5
Tuesday	8	6
Wednesday	10	3
Thursday	6	6
Friday	12	4

(a) Sam draws a composite bar chart to represent the data.
He has drawn the bar for Monday.



Complete the chart.

(b) In total, what fraction of the messages were emails?

Give your answer in its simplest form.

Total emails = 48
Total msgs = 24+48 = 72 = 2/3

Answer _____

Section H – Pictograms

Q23. A club rents films. These were the films rented on **Monday**.

Films rented on Monday

Comedy	12
Thriller	6
Romance	9
	Total = 27

(a) Draw a pictogram for this data.

Films rented on Monday

Key: ⊞ represents 4 films.

Comedy	⊞ ⊞ ⊞
Thriller	⊞
Romance	⊞ ⊞

(b) This pictogram represents the films rented on Tuesday.

Films rented on Tuesday

Key: ☺ to represents 2 films

Comedy	☺ ☺ ☺ ☺ ☺	=10
Thriller	☺	=2
Romance	☺ ☺ ☹	=5

The club manager says,

"Looking at the total number of films rented on **Monday and Tuesday**, half of them were Comedy."

Is he correct?
You **must** show your working.

Comedy = 10 — 10 less than half
Total = 17 — 17

manager is wrong

Q24. Gemma has four groups of friends on a social media site. The table shows the number of friends in each group.

Group	Number of friends
Family	8
Netball	8
School	26
Guides	11

(a) Which group is the mode?

Answer 26

(b) Gemma wants a pictogram to show the information.
She has drawn the first two rows.

Complete the pictogram.
Remember to complete the key.

Key: ○ represents 4 friends

Family	○ ○
Netball	○ ○
School	○ ○ ○ ○ ○ ○ ◑
Guides	○ ○ ◔

Q25. (a)

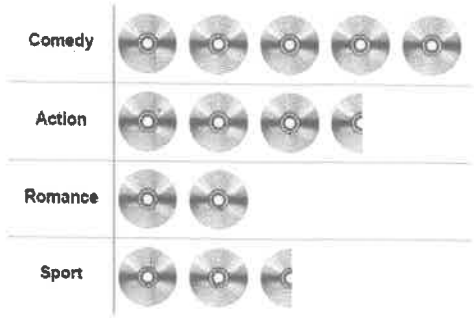
How many DVDs do you get for £35?

£10 for 3 → £30 for 9

£5 left → 1 more

Answer 10

(b) The pictogram shows some information about DVDs.
The key is missing.



The total number of DVDs is 260

Work out the number of **Sport** DVDs.

13 whole disks

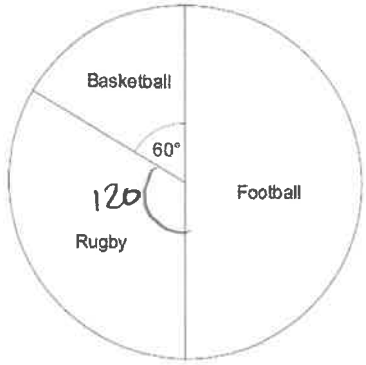
260 ÷ 13 = 20 → 1 disk = 20

Sports = 2.5 × 20 = 50

Answer 50

Section I – Pie charts

Q26. The pie chart shows the sports played by 30 boys.



(a) How many boys play Football?

1/2 of 30 =

Answer 15

(b) How many boys play Rugby?

1/3 of 30 = 10

Answer 10

Q27. A car park is open from 9 am to 6 pm.

(a) (i) 80 cars enter between 9 am and 10 am.
One-quarter of these cars are silver.

How many silver cars enter between 9 am and 10 am?

1/4 of 80 80 ÷ 4 = 20

Answer 20

(ii) 115 cars enter between 10 am and 11 am.
Kim says, "Exactly one-quarter of these cars are silver."

Show that she is wrong.

1/4 of 115 = 28.75

can't have decimal

(b) A data logging machine counts cars entering and leaving the car park.

Hour ending at	Cars entering	Cars leaving
10 am	80	5
11 am	115	25
12 noon	75	40
1 pm	35	35
2 pm	50	50
3 pm	40	45
4 pm	20	65
5 pm	10	115
6 pm	5	30

(i) The car park is empty at 9 am.

How many cars are in the car park at 10 am?

80 - 5

Answer 75

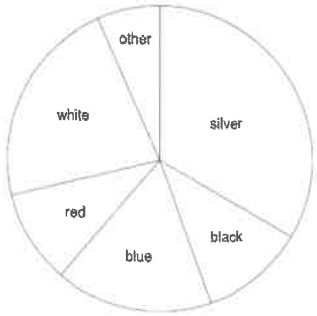
(ii) Barriers stop cars entering when the car park is full.
The car park is full at 12 noon.

How many cars are in the car park when it is full?

In 80 + 115 + 75 out = 5+25+40
= 270 = 70

Answer 270 - 70 = 200

(c) The pie chart shows information about the colours of the cars in the car park one day.



Complete the sentences.

(i) There are twice as many White cars as black cars.

Measure angles

(ii) $\frac{1}{3}$ of the cars are Silver

(d) Are there any purple cars in the car park on that day?

Tick a box.

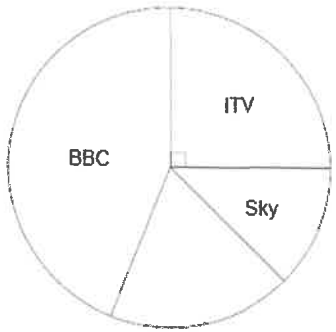
☐ Yes ☐ No ☑ Cannot tell

Give a reason for your answer.

Could be in 'other' group

Q28. Jack draws a pie chart to represent his time watching the news in January.
Altogether he watches 18 hours of news.

Time watching the news



(a) How many hours did he spend watching ITV news?

ITV = 90° = 1/4 1/4 of 18
= 4.5

Answer 4.5 hours

(b) Write down **one** criticism of his pie chart.

One part not labelled

(c) In February he also watches 18 hours of news.
He watches 10 hours on the BBC.

Jack says,
"This is more than in January because the pie chart shows I watched less than 9 hours of BBC news."

Comment on his statement. TRUE

9 hours would be ½ the pie chart, and BBC is less than half.

(1)

(d) In February he watches 2 hours of news on Sky.

Jack says,
"If I draw a pie chart for February the angle for Sky news will **not** be a whole number of degrees. This is because $\frac{2}{18}$ is **not** a terminating decimal."

Is his statement correct?
Tick a box.

☐ Correct ☑ Not correct

You **must** show your working.

$\frac{2}{18} = \frac{1}{9}$ $\frac{1}{9}$ of 360 = 40°

Section J – Basic probability

Q29. A music app has a shuffle play function.

This means that songs are played in a random order **without repeat**.

(a) Ruth puts 10 songs on shuffle play.
One of them is her favourite song.

Write down the probability that her favourite song plays first.

Answer $\frac{1}{10}$

(b) Ted puts songs A, B and C on shuffle play.

List all the possible orders of songs A, B and C.
One has been done for you.

A B C
A C B
B A C
B C A
C A B
C B A

Be systematic

Q30. (a) List **all** the factors of 30.

1 2 3 5 6 10 15 30

Answer

(b) A factor of 30 is chosen at random.
What is the probability that it is a 2-digit number?

8 factors, 3 2-digit $\frac{3}{8}$

Answer $\frac{3}{8}$

Q31. A number is picked at random from the first four **prime** numbers.

A number is picked at random from the first four **square** numbers.
The two numbers are added to get a score.

(a) Complete the table.

		Square numbers			
	+	1	4	9	16
Prime numbers	2	3	6	11	18
	3	4	7	12	19
	5	6	9	14	21
	7	8	11	16	23

(b) What is the probability that the score is a **prime** number?

Answer $\frac{6}{16} = \frac{3}{8}$.