



**St Paul's Catholic School
Mathematics GCSE Revision
MAY HALF TERM**

**PACK 4 – STATISTICS AND PROBABILITY
TOPICS TO GRADE 4/5**

Name: _____

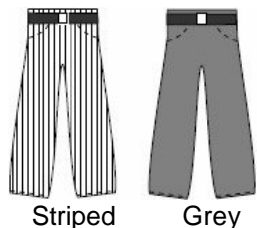
Maths Teacher: _____

Probability

Q1. Tommy has three T-shirts.



He has two pairs of jeans.



Today he is wearing the white T-shirt and the striped jeans.

(a) Complete the table to show all the combinations of T-shirt and jeans that Tommy could wear.

T-shirt	Jeans
White	Striped
White	Grey

(b) One morning Tommy dressed in the dark. (2)

He chose one T-shirt and one pair of jeans at random.

What is the probability that he chose matching T-shirt and jeans?

.....

Answer

(2)
(Total 4 marks)

Q2. A bag contains 6 red pens, 69 black pens and 25 blue pens.

(a) Write down the number of red pens as a fraction of the total number of pens in the box.
Give your answer in its simplest form.

.....

Answer

(2)

(b) What percentage of the pens are **not** black?

.....

Answer%

(1)

(c) Circle a word from the list to describe the chance of each of the following events.

(i) A pen chosen at random from the box is red.

impossible unlikely evens likely certain

(1)

(ii) A pen chosen at random from the box is **not** green.

impossible unlikely evens likely certain

(1)

(Total 5 marks)

Q3. Ronan is designing a game.
 He has two sets of discs laid face down on a table.
 The first set of five discs are labelled 1, 3, 5, 7, 9.
 The second set of four discs are labelled 2, 4, 6, 8.
 Players turn over one disc, at random, from each set and add the numbers together.

(a) Complete the table to show **all** the possible totals.

	1	3	5	7	9
2	3	5	7		
4	5				
6					
8					

(b) What is the probability of getting a total less than six?

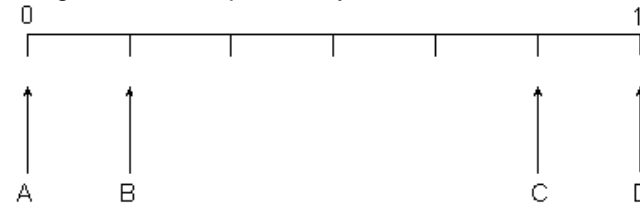
.....
 Answer

(c) Ronan uses the game to raise money for charity.
 Each player pays 20 p to play the game.
 If a player gets a total of exactly 13 they win a bar of chocolate.
 It costs Ronan 50 p for each bar of chocolate.
 If 100 people play the game, show that Ronan should expect to raise £12.50 for charity.

.....

(4)
 (Total 7 marks)

Q4. The diagram shows a probability scale.



An ordinary fair six-sided dice is rolled.

(2) (a) Which arrow represents the probability of rolling a 5?

Answer

(1)

(1) (b) Which arrow represents the probability of rolling a number less than 7?

Answer

(1)

(c) Draw an arrow on the scale to represent the probability of rolling an odd number.

(1)
 (Total 3 marks)

Q5. Here is a list of numbers.

5 7 5 6 4 9 8 10 5

(a) Work out the median.

.....

Answer

(2)

(b) One of the numbers is chosen at random.

(i) What is the probability that the number is 5?

.....

Answer

(1)

(ii) Put these events in order of likelihood starting with the least likely.

- A The number is 5.
- B The number is even.
- C The number is greater than 8.

.....

Answer

(2)
 (Total 5 marks)

Q6. Sarah is playing a game with a fair coin and a fair six-sided dice. She spins the coin and then throws the dice.

If the coin shows heads Sarah's score is 1 **more** than the number shown on the dice. If the coin shows tails Sarah's score is 2 **less** than the number shown on the dice.

(a) Complete the table to show all possible scores.

(2)

		Dice					
		1	2	3	4	5	6
Coin	Heads				5		
	Tails	-1					

(b) Work out the probability that Sarah's score is

(i) negative

Answer

(1)

(ii) more than 3.

.....

Answer

(2)
 (Total 5 marks)

Q7. Two fair dice are thrown and their scores added together.
The table shows some of the possible totals.

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	

(a) Fill in the missing number in the table.

(1)

(b) (i) Work out the probability that the total is 6.

.....

Answer

(1)

(ii) Work out the probability that the numbers on the dice are the same.

.....

Answer

(1)

(iii) Work out the probability that the total is a square number.

.....

Answer

(2)

(Total 5 marks)

Q8. Ramesh uses two identical, fair 3-sided spinners in a game.



He spins both spinners.
His score is the two numbers multiplied together.

(a) Show his possible scores in the table.

Second spinner

		First spinner		
		0	1	2
X	0			
	1			
	2			

(2)

(b) Ramesh says:

“I can only get four possible different scores, one of which is 0. Therefore the probability of a score of 0 is $\frac{1}{4}$ ”

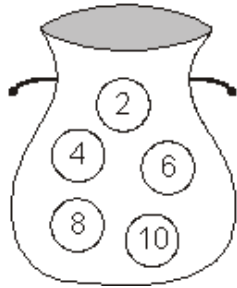
Explain why Ramesh is wrong.

.....
.....
.....

(1)

(Total 3 marks)

Q9. A bag contains five discs as shown.



One disc is taken from the bag at random.
It is then replaced.
Another disc is then taken from the bag at random.
The numbers on the two discs are added to make a score.

(a) Complete the table of scores.

+	2	4	6	8	10
2	4	6	8		
4	6	8			
6	8				
8					18
10				18	20

(b) What is the probability that the score is 16?

.....
.....

Answer

(c) Which is greater: the probability that the score is a square number
or
the probability that the score is a cube number?
You **must** explain your answer.

.....
.....
.....

(2)
(Total 5 marks)

Collecting Data and Questionnaires

Q10. Jane conducts a survey of the favourite colours of the students in her class. She records the results.

Male	Red	Female	Yellow
Male	Yellow	Female	Red
Male	Red	Female	Green
Female	Green	Female	Green
Female	Red	Male	Red
Male	Green	Male	Yellow
Male	Green		

Record the results in a two-way table.

(1)

(Total 3 marks)

(2)

Q11. A doctor wants to encourage her patients to take more exercise.
The doctor has approximately 500 patients.

She decides to do a survey about what exercise her patients take.

(a) This is a question in the survey.

<p>Q Do you exercise?</p> <p>A Tick a box</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes <input type="checkbox"/> Every day <input type="checkbox"/></p>

(i) Give a criticism of the question.

.....

.....

.....

(1)

(ii) Give a criticism of the response section.

.....

.....

.....

(1)

(b) This is another question in the survey.

<p>Q How many miles did you walk last week?</p>
--

Give a suitable response section for this question.

(1)

(c) (i) The doctor decides to use one of three methods to do the survey.

Method 1 Give the survey to the first 50 patients seen in a week

Method 2 Choose 50 patients at random

Method 3 Choose 26 patients, picking one whose surname begins with each letter of the alphabet

Give a reason why method 3 is **not** suitable.

.....

.....

.....

(1)

(ii) Which of the other two methods for doing the survey will give the most reliable results?

Give a reason for your choice.

.....

.....

.....

(1)

(Total 5 marks)

Scatter Graphs

Q12. Clive works for the local council.

One of his jobs is to check that taxi companies charge reasonable fares.

Each week he checks 10 taxi journeys with local companies.

- (a) Design a suitable observation sheet for Clive to use to record the fare and distance of each journey.

(2)

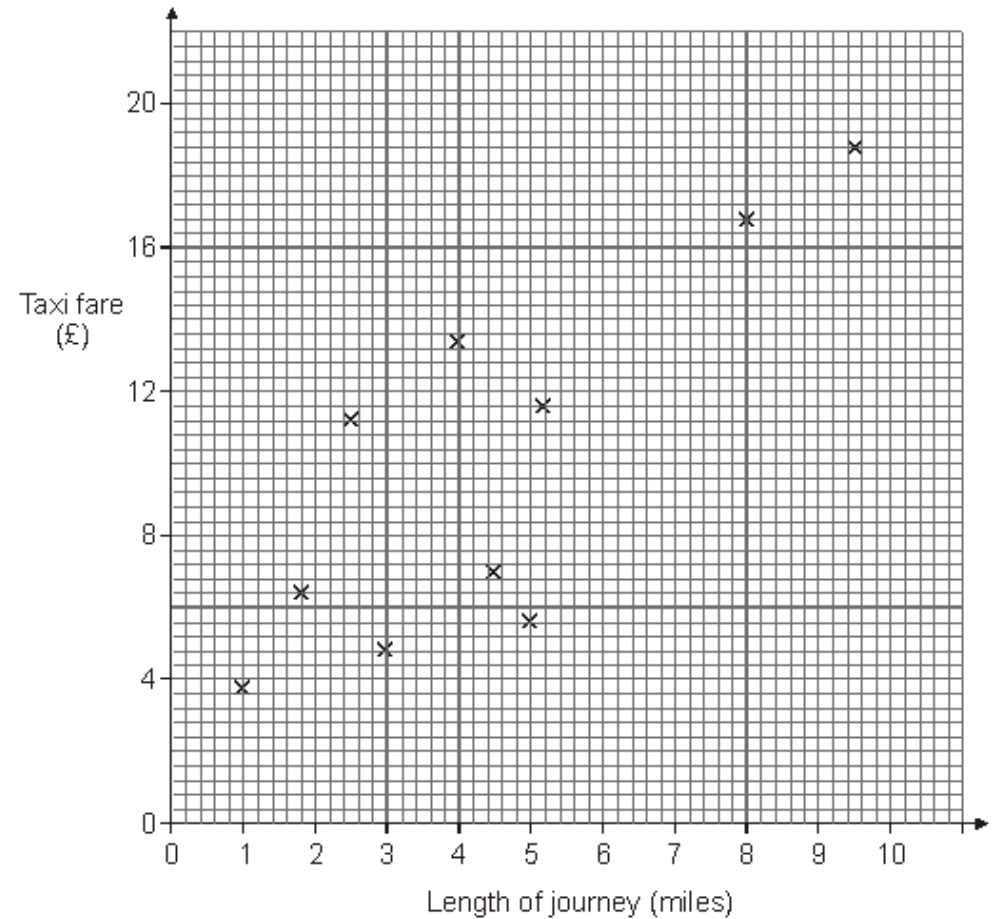
(b) Clive expects strong positive correlation between the length of the journey and the fare charged.

Explain why he might expect this.

.....

(1)

(c) The scatter diagram shows the results for a week in January 2009.



- (i) What was the fare for the 3-mile journey?

Answer £

(1)

- (ii) What would you expect to pay for a 7-mile journey?

Show how you obtain your answer.

Answer £

(2)

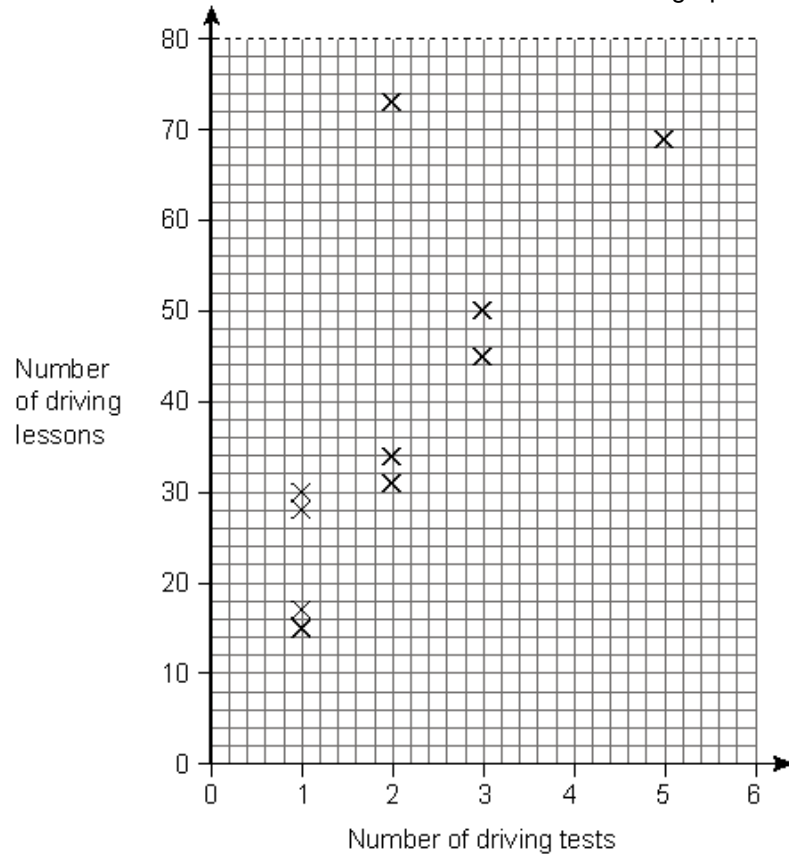
(d) Does the data support Clive's view about the expected correlation between the length of journey and the fare?

Give a reason for your answer.

.....

(1)
 (Total 7 marks)

Q13. Jeff wants to know the number of driving lessons he might need before he passes his driving test. He also wants to know the number of times he might have to take his driving test before he passes. He collects some data and shows it on this scatter graph.



(a) Jeff ignores one of the points on the scatter graph.

Circle this point and give a reason why it should be ignored.

Reason

.....

(2)

(b) Draw a line of best fit on the scatter graph.

(1)

(c) Jeff has already failed his driving test three times after a total of 40 driving lessons.

(i) Estimate how many **more** driving lessons Jeff needs if he is to pass his driving test on the fourth attempt.

.....

Answer

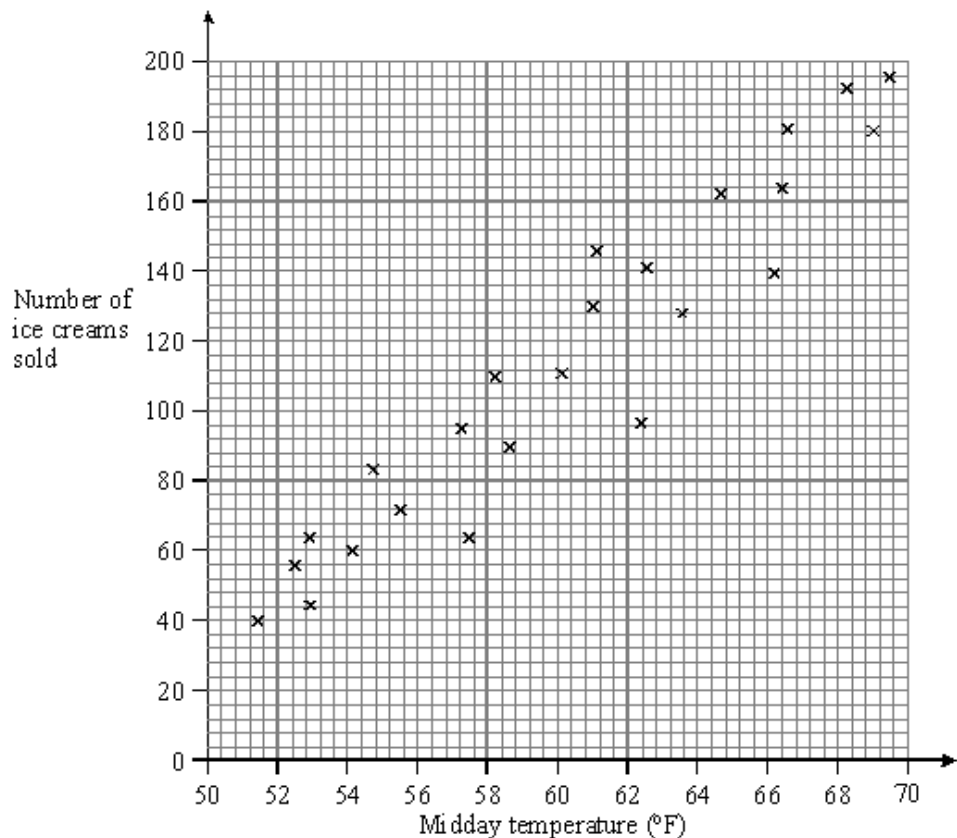
(2)

(ii) Give a reason why this estimate might be unreliable.

.....

(1)
 (Total 6 marks)

Q14. The scatter graph shows the number of ice creams sold plotted against the midday temperature.



(a) Draw a line of best fit on the scatter graph.

(1)

(b) Describe the relationship between the number of ice creams sold and the midday temperature.

.....

.....

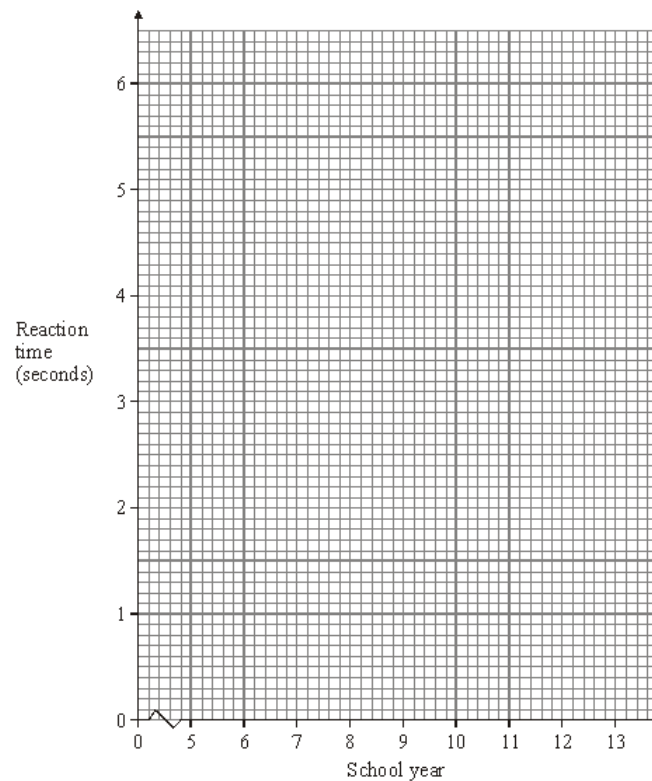
(1)

(Total 2 marks)

Q15. The table shows the school year and the reaction time of eight people who took part in the same test.

School year	5	7	8	9	10	11	12	13
Reaction time (seconds)	6	5	4.8	4.5	4	4.2	3.5	3

(a) Draw a scatter graph of these data.



(2)

(b) Draw a line of best fit on your scatter graph.

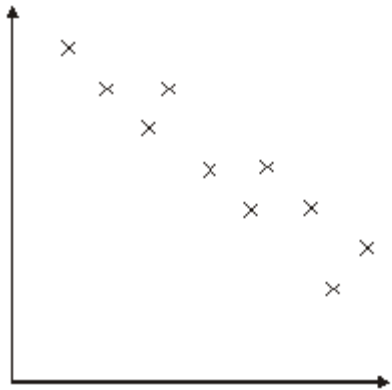
(1)

(c) Describe the relationship shown by your scatter graph.

.....

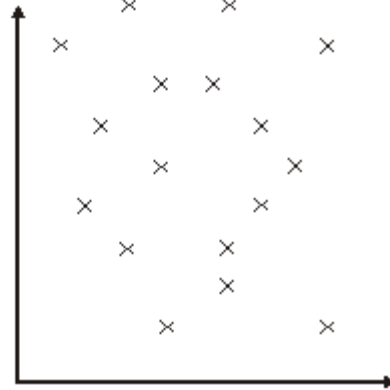
(1)
 (Total 4 marks)

Q16. (a) Write down the type of correlation shown in each of the scatter graphs, A and B, below.



Scatter graph A

Answer A

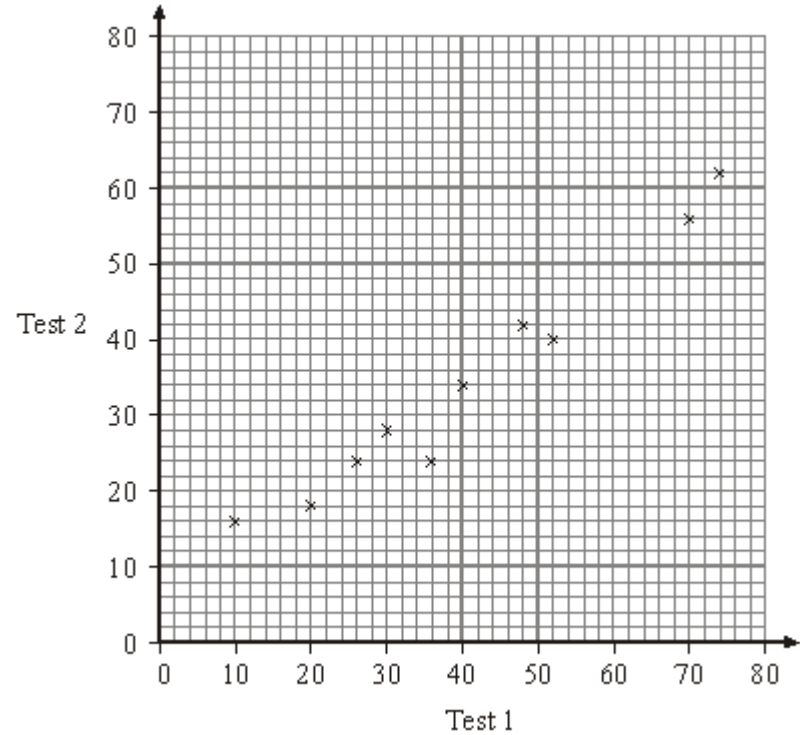


Scatter graph B

Answer B

(2)

(b) The marks for a group of pupils who sat two tests are shown in the scatter graph below.



(i) Draw a line of best fit on this scatter graph.

(1)

(ii) Use your line of best fit to estimate the Test 1 mark for a pupil who scored 50 in Test 2.

Answer

(1)

(Total 4 marks)

Averages

Q17. A girls' basketball team plays six matches.
The scores are

28 30 25 35 39 26

(a) What is the median score?

.....

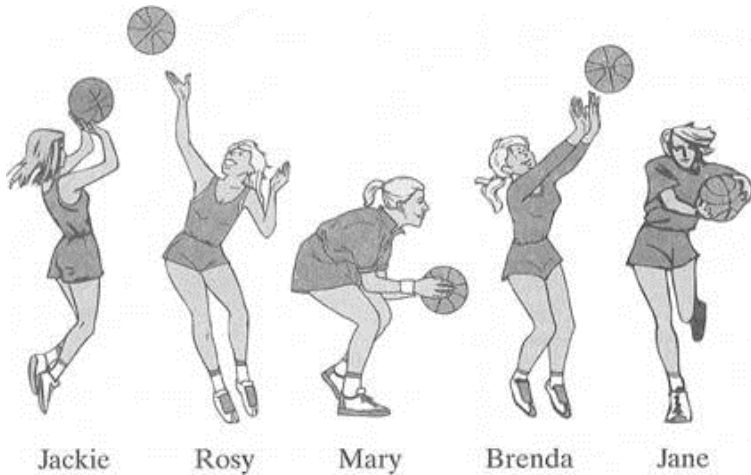
Answer

(b) What is the mean score?

.....
.....
.....

Answer

(c) These are the members of the team.



One girl is to be chosen at random to be captain.

What is the probability that her name begins with J?

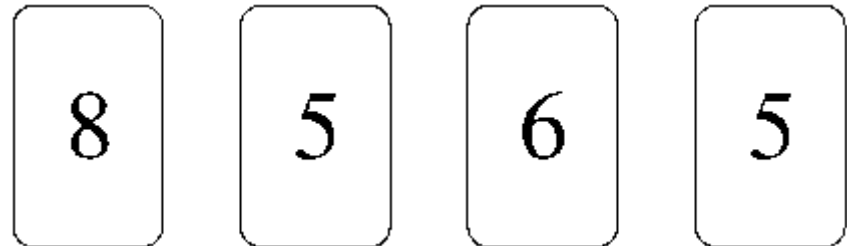
.....

Answer

(2)
(Total 7 marks)

Q18. Here are four cards.

(2)



(3)

James says that the mean of the numbers on the cards is higher than the mode.

Show that James is correct.

.....
.....
.....
.....
.....

(Total 3 marks)

Q19. The number of points scored by the Tigers in the last 10 rugby matches is listed.

38 16 18 76 32 16 16 40 60 42

(a) Calculate the range of these scores.

.....

Answer points

(1)

(b) (i) Write down the mode of these scores.

.....

Answer points

(1)

(ii) In the next match the Tigers score 25 points.

What effect does this have on the mode?

Tick the correct box.

Decrease

No change

Increase

(1)

(Total 3 marks)

Q20. The Quickpass driving school records the number of lessons that each person had before passing their driving test. The results for seven men are shown.

10 17 15 10 12 8 19

(a) Work out the range of these numbers.

.....

Answer

(1)

(b) Calculate the mean of these numbers.

.....

.....

.....

.....

Answer

(3)

(c) The number of driving lessons taken by a sample of women is summarised in the table.

Women	
Range	14
Mean	9

Write down **two** comparisons between the number of driving lessons taken by the men and the women.

Comparison 1

.....

.....

Comparison 2

.....

.....

(2)

(Total 6 marks)

Q21. A company puts this advert in the local paper.

AQA Motor Company
 Mechanic needed
 Average wage over £400 per week

The following people work for the company.

Job	Wage per week (£)
Apprentice	200
Cleaner	200
Foreman	350
Manager	800
Mechanic	250
Parts Manager	520
Sales Manager	620

(a) What is the mode of these wages?

.....

Answer £

(1)

(b) What is the median wage?

.....

Answer £

(2)

(c) Calculate the mean wage.

.....

Answer £

(3)

(d) Explain why the advert is misleading.

.....

(1)

(Total 7 marks)

Q22. Jim records how many text messages he receives each day for ten days.

3 0 1 4 1 4 6 1 20 0

(a) Work out the median.

.....

Answer

(2)

(b) Work out the mean.

.....

Answer

(2)

(c) Which of these two averages better represents the data?
 Explain your answer.

.....

(1)

(Total 5 marks)

Q23. Jody has a set of five single-digit number cards.



(a) She says the median is greater than the mode.
 Show that Jody is correct.

.....

(2)

(b) Here is another set of five cards.



Jody is asked to write numbers on the remaining two cards so that the median is the same as the mode.

She says, "If I write down two fives or two sixes or one of each, I cannot fail."

Show that Jody is correct.

.....

(3)

(Total 5 marks)

Q24. Every hour a bank records the number of customers waiting to be served.
The results for one Monday are shown.

Time	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm
Number of customers waiting	7	5	15	24	9	6	4

(a) At which one of these times were most customers waiting?

Answer

(1)

(b) Calculate the mean number of customers waiting at these times.

.....
.....
.....

Answer

(3)

(c) On Friday of the same week the mean number of customers waiting at these times was 20.

On which day should the bank employ more staff?
Explain your answer.

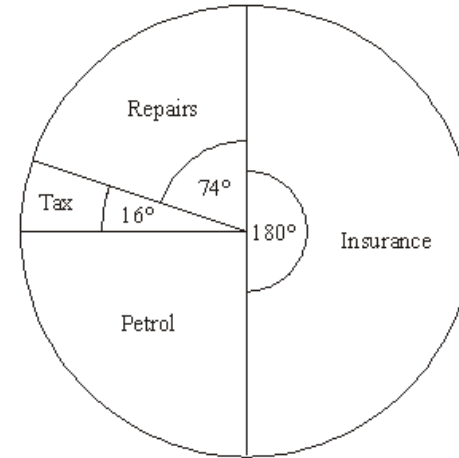
.....
.....
.....
.....

(2)

(Total 6 marks)

Pie Charts

Q25. A young driver has a small car.
The pie chart shows the annual costs for the car.



(a) What fraction of the annual cost is insurance?

.....
.....

Answer

(1)

(b) The annual cost of petrol was £600.

Calculate the total annual cost for this car.

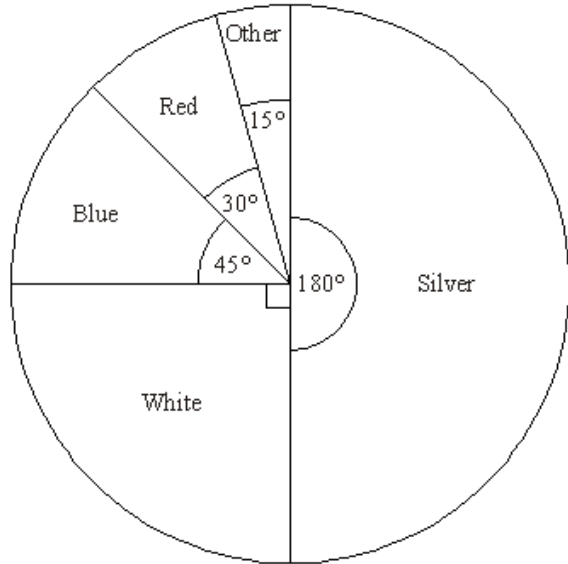
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Answer £.....

(3)

(Total 4 marks)

Q26. (a) 120 men were asked what colour car they own.
The pie chart shows the results.



Work out the number of men who own a blue car.

.....

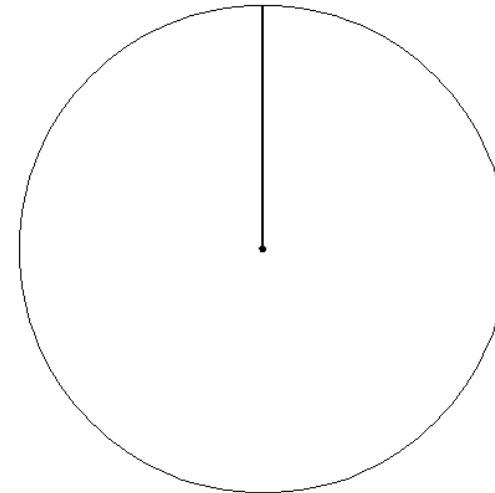
Answer

(b) 120 women were also asked what colour car they own.
The results are shown in the table.

Colour	Number of women
White	42
Blue	35
Silver	25
Red	10
Other	8

Draw and label a pie chart to show this information.

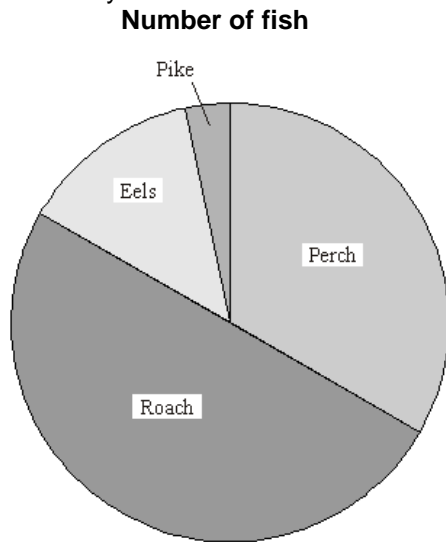
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(3)

(4)
(Total 7 marks)

Q27. The pie chart shows the number of each type of fish that Frank caught in one day.



(a) Tick **one** box for each statement below.

- (i) Half the fish caught were roach
- (ii) There were more eels caught than pike.
- (iii) The pike weighed more than all of the roach.

True	False	Cannot say
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(3)

(b) Frank caught 30 fish altogether.
One-third of the fish caught were perch.
How many eels and pike were caught altogether?

.....

Answer

(3)

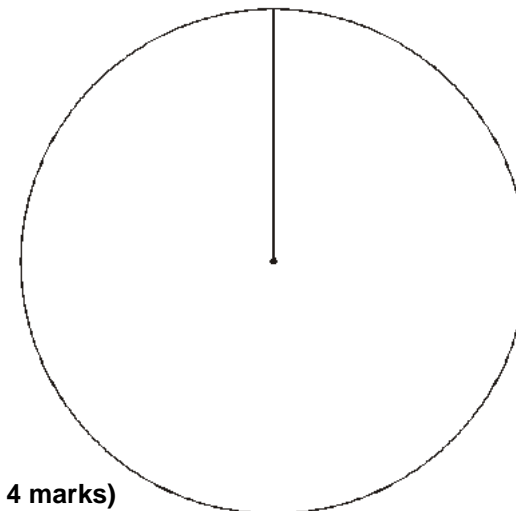
(Total 6 marks)

Q28. The number of complaints made about different parts of the Health Service last year is shown in the table.

Type	Number of complaints
Hospitals	400
Doctors	200
Dentists	80
Other	120

Draw and label a pie chart to represent these data.

.....



(Total 4 marks)

Q29. The table shows the races that 60 primary school pupils entered on their Sports Day. They each entered one race.

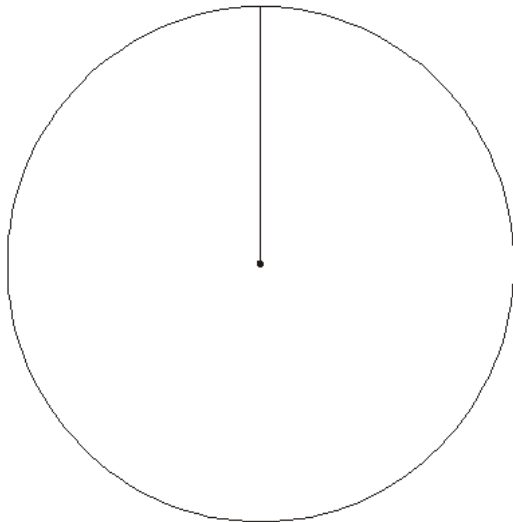
Race entered	Number of pupils
Egg and spoon	18
3-legged	20
Sack	12
Obstacle	10

(a) Draw and label a pie chart to represent the information in the table.

.....

.....

.....



(4)

(b) Work out the percentage of pupils who entered the egg and spoon race.

.....

.....

Answer%

(2)

(c) The pupils in the obstacle race took these times in seconds.

23 36 18 29 44 39 36 54 43 41

Draw an ordered stem and leaf diagram to show this information.

.....

.....

.....

.....

.....

Key: | 2 | 3 represents 23 seconds

(3)

(Total 9 marks)

Stem & Leaf Diagrams

Q30. A rounders coach records the number of rounders the players in her squad scored in a season.
All the players scored at least once.
She shows the data in a stem and leaf diagram.

Key	2	7	represents 27 rounders scored		
0	1	1	2	7	
1	2	5	5		
2	3	7			
3	6				
4	0				
5	0	9			

(a) What is the range of the data?

.....

Answer

(b) How many players are there in the squad?

.....

Answer

(c) What is the median number of rounders scored?

.....

Answer

(d) Calculate the mean number of rounders scored.

.....

.....

.....

Answer

(3)
(Total 6 marks)

Q31. The stem and leaf diagram shows the ages, in years, of 15 members of a badminton club.

Key: | **2** | 7 means an age of 27 years

2	7	8				
3	0	2	4	8		
4	1	2	3	3	4	6
5	3	6				
6	2					

(1) (a) What is the median age of the members?

.....

Answer years

(1)

(1)

(b) What is the range of the ages?

.....

Answer years

(1)

(1)

(Total 2 marks)

M1. (a) SS, SG, GS, GG
B1 for 2 or 3 correct (ignore repetitions)

B2

(b) Numerator of 2

B1

Denominator of 6

B1

Must have a fraction

[4]

M2. (a) $\frac{6}{6+69+25}$

$$\frac{6}{100}$$

M1

$$\frac{3}{50}$$

A1

(b) 31

B1

(c) (i) Unlikely

B1

(ii) Certain

B1

[5]

M3. (a) (3), (5), (7), 9, 11
 (5), 7, 9, 11, 13
 7, 9, 11, 13, 15
 9, 11, 13, 15, 17

-1 eooo

B2

(b) $\frac{3}{20}$

oe

B1

(c) $P(13) = \frac{3}{20}$ implies 15 winners in 100 plays

B1

(Chocolate costs) £7.50

B1

(Takings) $100 \times 20 (= £20)$

B1

(Profit) $£20 - £7.50 (= £12.50)$

B1

Award partial marks for stages shown

[7]

M4. (a) B

B1

(b) D

B1

(c) Arrow drawn to half way point

B1

[3]

(ii) CAB

B1 For sight of two correct probabilities correctly assigned

$$A = \frac{3}{9} \quad B = \frac{4}{9} \quad C = \frac{2}{9}$$

(Accept 3, 4, 2 for B1)

B2

[5]

M5. (a) Order the numbers

Allow 1 number missing or repeated

M1

6

A1

(b) (i)

$$\frac{3}{9}$$

oe 0.33 or better

B1

M6. (a)

Dice

Coin

	1	2	3	4	5	6
Heads	2	3	4	5	6	
Tails	-1	0	1	2	3	

(b) (i)

$$\frac{1}{12}$$

ft from a completed table or correct

ft may be cancelled eg $\frac{6}{12} =$

$$\frac{1}{2}$$

B1 ft

(ii) $\frac{6}{36}$

oe probability

B1

(ii) $\frac{5}{12}$

ft from a completed table or correct

ft may be cancelled eg $(\frac{6}{12}) = \frac{1}{2}$

Allow B1 for numerator 5 of any fraction < 1

B2 ft

[5]

(iii) Identifies (1,) 4 and 9 as squares
ft Their 12 if square

M1

$$\frac{7}{36}$$

oe probability

A1ft

[5]

M7. (a) 12 in table

B1

(b) (i) $\frac{5}{36}$

oe probability

B1ft

M8. (a) 0, 0, 0, 0, 1, 2, 0, 2, 4

7 or 8 correct B1

B2

(b) 5 out of 9 for score of 0

oe ft from their table

B1 ft

[3]

are cube numbers and chooses square
 oe eg, convincingly lists
 appropriate outcomes
 or annotates table
 B1 Part of the B2 explanation
 but one missing
 or incorrect value or values
 correct but
 does not choose
 B0 There are 2 square
 numbers but only
 1 cube number

M9. (a) All entries are correct

+	2	4	6	8	10
2	4	6	8	10	12
4	6	8	10	12	14
6	8	10	12	14	16
8	10	12	14	16	18
10	12	14	16	18	20

B2ft

[5]

B1

(b) $\frac{\text{Their } 3}{25}$

B1 Denominator of 25, fraction of
 value less than 1

SC1 $\frac{3}{35}$

B2ft

M10. R Y G

M 3 2 2

F 2 1 3

Table 3×2 or 2×3

If gender ignored and total
 number of students used M0

M1

Fully correct

Accept tally marks;

4 or 5 correct entries A1; SC2 for

(c) There are 4 outcomes that are square numbers but only 3
 that

	M			F		
R	Y	G	R	Y	G	
3	2	2	2	1	3	

or

	M			F		
R	3		R	2		
Y	2		Y	1		
G	2		G	3		

Or

		R	Y	G
M	3	2	2	

		R	Y	G
F	2	1	3	

4 or 5 correct entries SC1

A2

[3]

M11.

(a) (i) Too vague
oe

B1

(ii) Not enough choices or choices overlap
oe

B1

(b) Response section that covers values from 0 to at least 5 with no missing values and no overlapping values

B1

(c) (i) Too small a sample or other sensible reason
eg, may not have anyone whose surname begins with X or Z

B1

(ii) Method 2, all patients have equal chance

B1

[5]

M12.

(a) Sheet with 10 rows or columns and a section for distance and fare

Deduct a mark if not complete

B2

(b) Longer taxi rides always cost more and cost per mile should be about same

oe

B1

(c) (i) £4.60 - £5.00

		B1				B1
	(ii) Line of best fit <i>Fares about double distance</i>	M1		(c) (i) Their reading from their line of best fit at $x = 4$ <i>ft A line of best fit with a positive gradient (intended straight)</i>		M1
	14 <i>ft their line of best fit</i>	A1		Their reading – 40 evaluated correctly		A1 ft
	(d) Yes, positive correlation <i>Accept: No, correlation is weak positive</i>	B1	[7]	(ii) Quite a small sample or mention of any other variable which may confound <i>eg, depends on age / instructor / examiner etc</i> <i>Jeff better than ave / worse than ave</i> <i>Allow incorrect or irrelevant statements as long as they are not contradictory</i>		B1
M13.	(a) Circles (2, 73) <i>Any clear indication</i>	B1				[6]
	This is an outlier / extreme value <i>Does not follow pattern</i> <i>oe eg, far more lessons than expected</i>	B1 dep		M14.	(a) Line crossing between 20 and 40 and within 1 cm of (70,200) <i>Must be ruled, at least 10 cm long</i>	B1
	(b) Line of best fit <i>Must pass between (1, 15) and (1, 25) and (5, 65) and (5, 80)</i>			(b) As one goes up so does the other <i>Positive correlation oe</i> <i>Or hotter it gets the more ice</i>		

(c) $\frac{2}{5}$

oe; numerator, B1; denominator, B1 (fraction ≤ 1)

B2

[7]

(ii) No change

B1

[3]

M18. Mode = 5

$\frac{24}{5}$

Mean = 6

*oe valid explanation
eg, mean > 5 because all the numbers are ≥ 5*

B1

M1

A1

[3]

M20. (a) 11

B1

(b) Adding at least 6 values

Total of 72-110 → M1

M1

"total" ÷ 7

M1

= 13

A1

(c) Comparison of spread

*Strict ft
eg Women have a bigger range
Men's range is 11 and
women's range is 14*

B1 ft

M19. (a) 60

B1

(b) (i) 16

B1

Comparison of mean

*Strict ft
eg Men have a bigger mean
Men's mean is 13 and*

women's mean is 9
or men have more lessons
(on average)

B1 ft

B1

[7]

[6]

M21. As a general rule for money answers, if £4.20 is the correct answer then:

Accept £4.20p and 420p with the £ sign crossed out; penalise £4.2 and £420p

(a) £200

Allow names, Apprentice and/or Cleaner

B1

(b) Put data in order

M1

£350

Foreman

A1

(c) 200 + 200 + 350 + ...

Attempt to add the 7 numbers; total underneath column OK

M1

Their 2940 ÷ 7

M1 dep

£420

A1

(d) Average is for the whole company not just for the mechanic

Mechanic only gets £250 oe he gets £150 less (than average)

M22. (a) 0 0 1 1 1 3 4 4 6 20

At least first 6 or last 6 in correct order

M1

2

A1

(b) $\sum x \div 10$

Allow 38 $\leq \sum x \leq 42$ if no addition seen

M1

4

A1

(c) Median - omits rogue value

or

Mean - uses all values

B1

[5]

M23. (a) Median = 2
 Mode = 1

B1
B1

(b) 5,5 gives 5, 5, 5, 5, 6
 Median = mode = 5

6,6 gives 5, 5, 6, 6, 6
 Median = mode = 6

5,6 gives 5, 5, 5, 6, 6
 Median = mode = 5

*E2 For 2 correct medians and modes
 and reordering shown
 or for all 3 correct medians and modes
 but reordering not shown*

*E1 For 1 correct median and mode
 and reordering shown
 or for 2 correct medians and modes
 but reordering not shown*

E3

[5]

M24. (a) 1 pm
oe eg, 13:00

B1

(b) Attempts to sum the values
Sight of 70

M1

Attempts to divide Their sum by 7

M1dep

10

A1

(c) Friday, because there are more people waiting on a Friday
*oe B1 Friday, reason attempted
 strict follow through from
 their (b)*

B2ft

Alt

Cannot tell, one set of data for each day is not enough
*oe B1 Cannot tell, reason
 attempted*

B2ft

[6]

15

$45^\circ = 15 \text{ men}$

A1

M25. (a) $\frac{1}{2}$

Accept 0.5 oe eg $\frac{180}{360}$, half,
50%
NOT $180 \div 360$

B1

(b) Any one correct method seen
or any one correct angle seen

$\frac{360}{120} \times 42$ or 3×42

Can be one correct sector,
labelled correctly

M1

(b) $\frac{360}{90}$ or 4 or $\frac{1}{4} = 600$ $\frac{1}{2} = 1200$

oe Insurance clearly 1200

M1

$126^\circ, 105^\circ, 75^\circ, 30^\circ, 24^\circ$

4 or 5 correct angles

A1

4×600

oe $600 + 600 + 2 \times 600 = M2$
Allow sensible build up

M1

All 5 angles drawn correctly $\pm 2^\circ$
Must be only 5 sectors

A1

= £2400

A1

All 5 sectors labelled in correct order of size
Must be only 5 sectors

B1

[4]

[7]

M26. (a) $\frac{45}{360}$ or $360 \div 45 (= 8)$
 $180^\circ = 60 \text{ men}$

M1

M27. (a) (i) True

B1

$\frac{45}{360} \times 120$
or $120 \div "8"$
 $90^\circ = 30 \text{ men}$

M1 dep

(ii) True

B1

(iii) Cannot say

B1

(b) $\left(\frac{1}{3} \times 30\right)$ or $\left(\frac{1}{2} \times 30\right)$ or 10 or 15

oe

M1

$$30 - \left(\frac{1}{30} \times 30\right) - \left(\frac{1}{2} \times 30\right)$$

oe

M1

5

Accept 4 eels and 1 pike

Note: $\frac{5}{30} \Rightarrow M2A0$

A1

[6]

M28. Any correct method

$$\frac{400}{800}$$

eg $\frac{400}{800} \times 360^\circ$

*Any one correct angle seen or implied 180°, 90°, 36° or 54°
Not 4 quarters but must be 4 sectors*

M1

All 4 angles correct

180°, 90°, 36° and 54° seen or implied

A1

4 sectors drawn accurately and correct

$\pm 2^\circ$

B1

Correct labelling, in correct proportions

Exactly 4 sectors

*Hospitals in largest sector...
Dentists in smallest sector etc
Not D & D alone*

B1

[4]

M29. (a) Fully correct pie chart, correctly labelled with all sector angles correct (108°, 120°, 72° and 60°) (sectors ± 2°)

B3 4 correct sectors drawn with no/wrong labels

or

2 correct sectors drawn and 4 labels

in correct order of size

B2 2 correct sectors drawn; with no/wrong labels

or

1 correct sector drawn and 4 labels

in correct order of size

or

4 correct angles calculated

B1 1 correct sector drawn; no/wrong labels

or

1 correct angle calculated

or

4 sectors labelled in correct order of size

B4

(b) $18 \div 60 \times 100$

oe eg $\frac{3}{10} \times 100$ or $\frac{108}{360} \times 100$

M1

30

A1

(c) Stem (1, 2, 3, 4, 5)

B1

Leaf (8) (3,9) (6,6,9) (1,3,4) (4)

B1 for 3 or 4 rows correct

B1 not ordered

B2

[9]

M30. (a) 58

B1

(b) 13

B1

(c) 15

B1

(d) $\sum x$ at least 6 values

$11 + 42 + 50 + 36 + 40 + 109$

M1

their 288 ÷ their 13

M1 dep

22.(2)

22.1; 22.15(...) or 22 with working

A1

[6]

M31. (a) 42

B1

(b) 35

B1

[2]