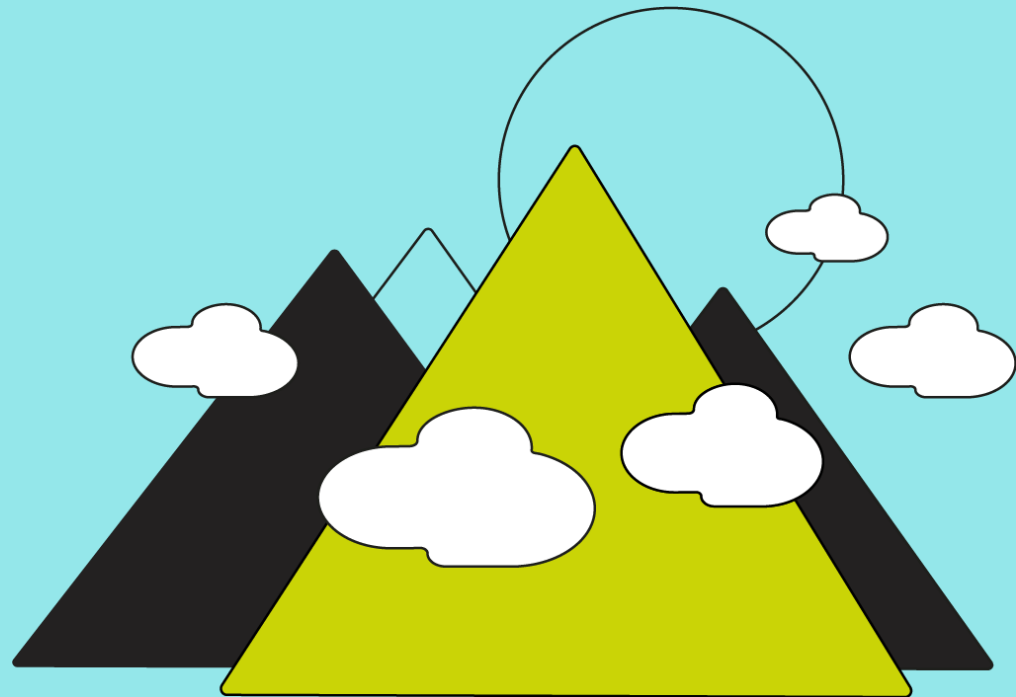


Exam Review

GCSE Statistics June 22

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General Comments

- Standard techniques
- Extended response questions
- 'Explain' 'Assess' 'Interpret'
- Context
- Continue to be unfamiliar with particular topics
- HANDWRITING!
- Checking answers
- Use of correct equipment

Foundation Paper 1

1 The incomplete pictogram gives information about the numbers of cars sold from a garage in August and in September.

Month	Number of cars
August	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>
September	<div><div></div><div></div><div></div><div></div></div>
October	
November	

Key:

represents 10 cars

Students not understanding the key word “Explain”
Failed to reference the key in their answer

In October, 25 cars were sold from the garage.

In November, 17 cars were sold from the garage.

(c) Explain why the use of this key may **not** be appropriate for representing 17 cars in the pictogram.

4 Alexa needs to know the population of California.

Using the internet, Alexa found that an estimate for the population of California in 2019 is 39.5 million people.

(Source: www.worldpopulationreview.com)

(a) Explain why this statistic is an example of secondary data.

(1)

(b) Give one advantage and one disadvantage of using secondary data.

Advantage

Disadvantage

(2)

Part (b) Students gave
2 advantages, or 2
disadvantages
Or gave a response to
primary data

Sense checking

5 Jane is a car mechanic at MPG Autos.

Jane recorded the time, in minutes, that she took to change a tyre on each of 9 cars.

Here are her results.

25 32 19 27 17 24 35 29 15

Most common error is failing to input one value. Check the correct number are used!

Crossover questions Paper 1

13/2 (c)

In 2017, the number of people age 100 and older (100+) in the United Kingdom was 13 310

(Source: *Office for National Statistics*)

Using the information above and information from the population pyramid,

- (c) explain why the percentage of the population in the age group 100+ is given as 0.0% on the population pyramid.
You must show your working.

Quite a few students did not give any mathematical reasoning, and just gave a worded answer which scored no marks. The question clearly states '**You must show your working**', and this question was answered poorly.

	9	8	7	6	5	4	3	2
Mean score	2.38	2.08	1.74	1.39	0.93			
					0.99	0.30	0.10	0.01

Crossover Paper 1

Here is the information about motorcycles from the spreadsheet with the data cleaned.

Speed (s miles per hour)	Percentage of motorcycles
$30 \leq s < 40$	0
$40 \leq s < 50$	2
$50 \leq s < 60$	7
$60 \leq s < 70$	24
$70 \leq s < 80$	56
$80 \leq s < 90$	11
Total	100

Linear interpolation
nearly always
tested on
foundation.
Answered poorly on
both papers.

- (c) Use linear interpolation to work out an estimate of the median speed of the motorcycles.

	9	8	7	6	5	4	3	2
Mean score	2.65	2.11	1.43	0.82	0.45	0.21		
					0.50	0.19	0.07	0.03

..... miles per hour
(3)

Higher Paper 1

Avoid contradictions

- 4 A supermarket chain has 93 stores in the United Kingdom with a total of 4502 employees. Each store is either a large store or a small store.

The directors of the supermarket chain are proposing to make changes to the employees' working hours. The directors want to survey a sample of 450 employees from the total workforce in order to ask them for their views on the proposed changes.

Three possible sampling methods in order to select the employees to be in the survey are suggested.

Method A The directors will choose two employees from each small store and six employees from each large store.

Method B All 4502 employees are allocated a number from 0001 to 4502
Start with number 0010 and take every 10th employee so that the sample consists of employees with the numbers 0010, 0020, 0030, ... and 4500

Method C Each employee in each store will be given a raffle ticket and 10% of the number of employees in each store will be chosen at random by taking raffle tickets out of boxes, one box for each store.

For each of the three methods, identify the sampling method and discuss whether the sampling method is an appropriate way to select the employees to be in the survey.

As part of your discussion you should also state, with reasons, which of the three sampling methods is the most appropriate method for the directors to use.

Higher paper 1

- 10 Huan has applied for a job at a college. As part of the interview process all candidates must take a numeracy test and a literacy test.

The table below gives Huan's score for the numeracy test and his score for the literacy test. The table also gives the mean and the standard deviation of the scores for each of these two tests for all candidates who were interviewed for the job.

Test	Huan's score	Test mean	Test standard deviation
Numeracy	49	42	3.5
Literacy	50	40	7.5

Huan concludes that because he scored a higher mark in literacy than in numeracy he performed better in literacy than in numeracy as compared to the other candidates.

Use statistical calculations to assess Huan's conclusion.

Higher Paper 1

Context matters!

- 12 A game is played with 4 ordinary 6-faced dice.
Each dice is to be rolled once and the number of dice that land on a six is recorded.
- (a) Write down **two** conditions needed so that a binomial distribution is a suitable model for the number of sixes recorded.

(2)

Higher paper 1

- (b) Calculate the probability that all of the 4 dice land on a six.
Give your answer as a fraction.

(2)

Generally answered well, but some students made life difficult by converting to decimals or rounding too early.
Most common incorrect answer was to multiply by 4, not raise to the power of 4.

Higher paper 1

- (c) Calculate the probability that at least 2 of the 4 dice land on a six.
Give your answer as a fraction.

The most common error was to omit the nCr aspects of the binomial calculations.

(3)

	9	8	7	6	5	4	3	2
Mean score	2.49	1.63	0.64	0.19	0.03	0.01		

Foundation paper 2

Answered very well,
common with GCSE
paper

- 4 Nikola asks 50 male and 50 female drivers arriving at a car park if the type of car they are driving is petrol, diesel or electric.

The two-way table shows some information about her results.

	Car type			Total
	Petrol	Diesel	Electric	
Male driver	29		3	50
Female driver		17	1	50
Total	61		4	100

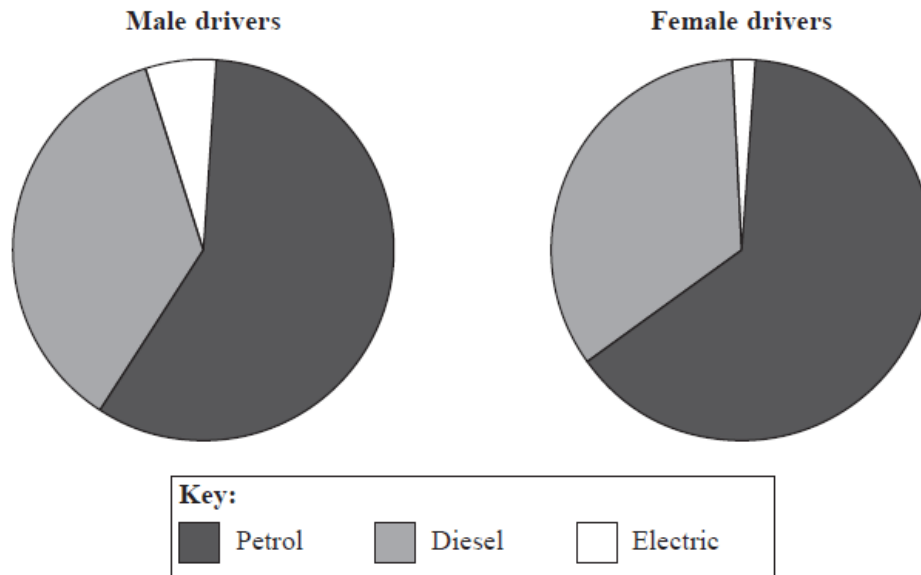
- (a) Complete the two-way table.

(2)

Foundation paper 2

Rounding errors.
Reading instruction- need to show the calculation

Nikola wants to compare her results for male drivers with her results for female drivers. To do this she uses the information she collected to draw the two pie charts shown below.



- (b) Work out the angle for electric cars in the pie chart for male drivers.
You must show the calculation.

Two-way tables	1.90	2
Pie chart	0.79	2

Foundation paper 2

5 (a) Explain what is meant by a simple random sample.

(1)

Don't just repeat the words!

Foundation paper 2

The manager of a health centre is reviewing the amount of time allowed for each patient to be seen by a doctor.

The manager wants to get the opinions of the people registered at the health centre.

She plans to give a questionnaire to each patient who has an appointment with a doctor next Monday. She wants each patient to complete the questionnaire at home and return the completed questionnaire to the health centre.

(b) Assess the manager's plan to get the opinions of the people registered at the health centre.

"Assess" is the command word.

3 marks- 3 reasons.

Foundation paper 2

Here is an open question that the manager is considering for her questionnaire.

What do you think about the 5 minutes currently allowed for appointments?

This is not a good question.

(c) Give one reason why.

Context matters- don't give opinion on the actual question

(1)

Foundation Paper 2

- 9 The table gives, for the Isle of Skye, the number of days with rainfall during the 30 days of April 2019 and during the 30 days of June 2019

Month	April	June
Number of days with rainfall	9	13

(Source: www.isleofskyeweather.co.uk)

- (a) Use the information in the table to find the absolute risk of rainfall for a day in April.

Good question for tier of entry decisions

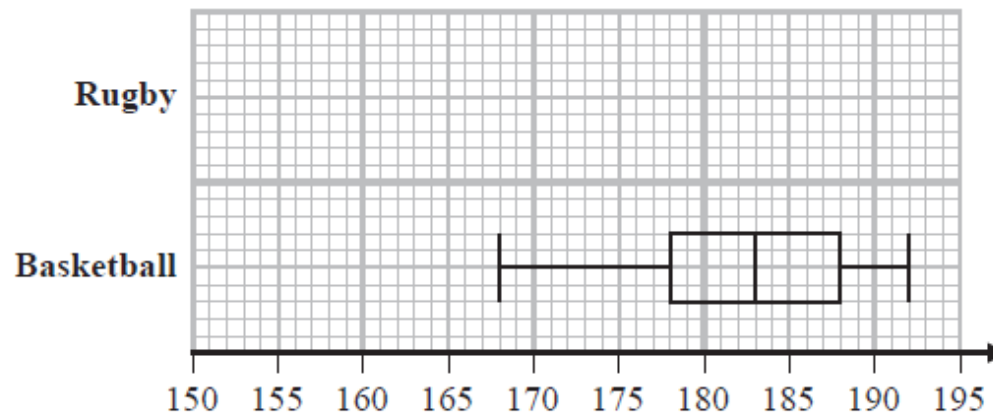
Crossover paper 2

Don't give up! Use the hint in the question
Use of ruler/ pencil/ plotting errors

10 Bill investigated the heights of females competing in different sports.

Using data from the internet, he recorded the height, in cm, of each female in a sample of 15 female rugby players and the height, in cm, of each female in a sample of 15 female basketball players.

He drew the box plot below for the recorded heights of the 15 female basketball players.



	9	8	7	6	5	4	3	2	1
Mean score/ 3	2.99	2.97	2.94	2.92	2.82	2.35	1.51		
					2.70	1.97	0.99	0.40	0.14

Crossover paper 2

- (b) Compare the two distributions of heights.
Give **three** comparisons and interpret one of your comparisons.

Reminder of what comparisons **are** acceptable.

Interpret

Comparison	Interpretation
Basketball <u>median</u> > rugby median	Basketballers are taller (on average)
Basketball <u>IQR</u> = rugby IQR	Similar variation in height
Basketball <u>range</u> < rugby range	Basketballers' heights (slightly) more consistent
Basketball <u>no skew/symmetric(al)</u> and Rugby <u>positive skew</u>	Rugby players more varied above median (basketball same either side)

Crossover paper 2

11 Irina is investigating whether the percentage of the population of a country living in urban areas has an effect on the life expectancy in that country.

(a) Suggest a hypothesis Irina could use for her investigation.

Tier decision question.

Students missed the word **urban** in both tiers.

Hypothesis is not a question

	9	8	7	6	5	4	3	2	1
/ 1	0.98	0.96	0.93	0.86	0.76	0.60	0.38		
					0.78	0.60	0.36	0.13	0.04

Crossover paper 2

Irina used statistical software to draw a scatter diagram for the information in the table.

(b) Give a reason why a scatter diagram is an appropriate diagram to use.

(1)

(c) For this investigation, which variable is the explanatory variable?
Give a reason for your answer.

(2)

Need to use the correct language

Crossover Paper 2

- (d) Explain, giving a statistical reason, whether or not this scatter diagram supports your hypothesis in part (a).

(2)

For these 10 countries, the double mean point of the data is (63.9, 77.8).

- (e) Using this information, draw a line of best fit on the scatter diagram.

(2)

Using statistical software, Irina finds that the gradient of the line of best fit should be 0.19

- (f) Interpret the gradient of the line of best fit.

Use of equipment

(1)

Higher Paper 2- Q7c

For a long distance journey, such as London to Manchester Piccadilly, a train is only considered to be late when it arrives more than 10 minutes late.

Andy says that more than 1 in 3 trains from London arrive late at Manchester Piccadilly.

(c) Determine whether or not Andy is correct.

You should comment on the reliability of your conclusion.

Success linked with part b

Good use of area

Few commented on the reliability of the data

Higher Paper 2

- 10 Changes in the cost of living in the United Kingdom are measured by the consumer price index (CPI).

The table shows the index numbers for June 2019, using 2015 as base year, of the items that contribute to the CPI.

The table also shows the weightings for how the spending by the Jones family is divided between these items.

Item	Index number	Jones family weighting	
Food, alcohol and tobacco	106.4	17	
Clothing and footwear	102.0	8	
Housing and services	107.5	32	
Transport	112.5	6	
Communication, recreation and leisure	108.9	25	
Health, education and miscellaneous	106.6	12	

(Source: *Office for National Statistics*)

Using 2015 as base year, the CPI for June 2019 was 107.9

Compare the overall change in the cost of living for the Jones family between 2015 and June 2019 with the change in the CPI between 2015 and June 2019

Explain whether or not it is possible to conclude from your calculations that the Jones family is financially better off or worse off in June 2019 as compared with 2015

Only most able attempted this.

Open question- Students need more practice at this type of question

Using exemplars

Student response A

Richard wants to compare the average weight of the male cats with the average weight of the female cats.

Richard thinks that he should use either the mean or the median.

- (a) Which one of the mean or the median do you think he should use?
Give a reason for your answer.

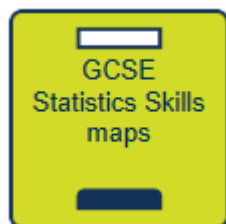
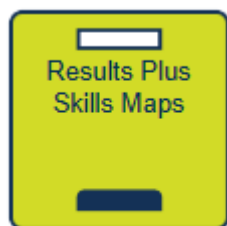
Median because of outliers

Richard plans to use a scatter diagram in order to compare the weights of the male cats with the weights of the female cats.

- (b) Discuss whether or not a scatter diagram would be a suitable diagram to use.

No because you can't label both ~~axis~~ axis

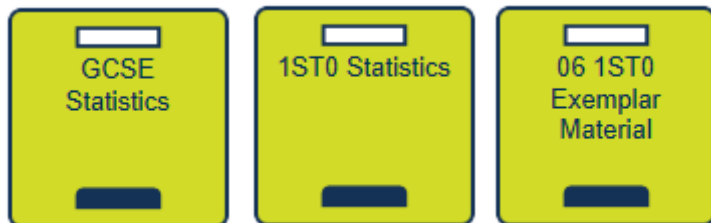
Resources



1ST0 Statistics - June 2022				Edexcel averages: mean scores of students who achieved grade											
Question	Skill tested	Mean score	Max score	Mean %	ALL	9	8	7	6	5	4	3	2	1	U
Paper 1F															
CALCULATOR (F)															
Q01a	Pictogram	0.95	1	95	0.95	-	-	-	-	0.98	0.96	0.96	0.95	0.91	0.74
Q01b	Pictogram	1.54	2	77	1.54	-	-	-	-	1.73	1.65	1.54	1.46	1.19	0.71
Q01c	Pictogram	0.59	1	59	0.59	-	-	-	-	0.65	0.63	0.61	0.55	0.47	0.31



Resources



 [GCSE Statistics Exemplars.pdf](#)



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