

Name: _____

GCSE Statistics

Hypotheses

Total marks available: 21

Total marks achieved: _____

Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, Centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided
 - There may be more space than you need.
- Scientific calculators may be used.
- You must show all your working out with your answer clearly identified At the end of your solution.

Information

- The marks for each question are shown in brackets
 - use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Q1.

Ron wants to investigate the average summer temperature in European cities. He thinks this will be affected by the height of the city above sea level.

He writes down two statements.

Statement A: Do cities which are higher above sea level have a lower summer temperature?

Statement B: The higher the city is above sea level the lower the summer temperature is.

(a) Statement A is **not** a hypothesis.

Explain why.

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(1)

Ron uses Statement B as his hypothesis.

(b) Write down two variables Ron needs to use in his investigation.

Variable 1

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Variable 2

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(2)

(Total for question = 3 marks)

Q2.

Aneena wants to investigate whether the boys at her school do more exercise than the girls at her school. Suggest a hypothesis Aneena could use.

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(1)

(Total for question = 1 mark)

Q3.

The table shows information about ten films that each won the Best Picture Oscar award.

Year	Film Title	Runtime (minutes)	USA Box Office takings (\$ thousands)	Worldwide Box Office takings (\$ thousands)	IMDb rating
2016	Moonlight	111	27 851	55 561	7.5
2015	Spotlight	128	45 056	91 191	8.1
2014	Birdman	119	42 341	103 215	7.8
2013	12 Years a Slave	134	56 672	187 733	8.1
2012	Argo	120	136 026	232 326	7.7
2011	The Artist	100	44 672	133 433	7.9
2010	The King's Speech	118	138 797	373 700	8.0
2009	The Hurt Locker	131	17 018	49 231	7.6
2008	Slumdog Millionaire	120	141 320	377 911	8.0
2007	No Country for Old Men	122	74 284	171 627	8.1

(Source: IMDb)

Norman is investigating whether there is a relationship between the runtime of a film and the USA Box Office takings.

Write down a suitable hypothesis for this investigation.

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(1)

(Total for question = 1 mark)

Q4.

A librarian wants to investigate, for books in her library, if there is a relationship between how old a book is and for how long it is borrowed.

(a) Suggest a hypothesis that the librarian could use.

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(1)

(b) Write down the two variables the librarian should use for her investigation.

..... and
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(1)

(Total for question = 2 marks)

Q5.

Seb thinks that the number of medals won by a country in the Olympic Games is affected by the wealth of the country.

Suggest a hypothesis you could use to investigate this.

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(1)

(Total for question = 1 mark)

Q6.

Jean is investigating if students at her college buy more *ebooks* downloaded from the internet than books from shops.

Write down a hypothesis that Jean could use.

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(1)

(Total for Question is 1 mark)

Q7.

A farmer is going to do an experiment to find out if using a new fertiliser will produce more wheat.

Write down a hypothesis he could use.

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(1)

(Total for Question is 1 mark)

Q8.

A researcher is investigating how safe residents of different ages feel in their community at different times of the day.

Suggest a hypothesis the researcher can use.

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(1)

(Total for Question = 1 mark)

Q9.

Zoe thinks the cost of a concert ticket depends on how long the concert lasts.

She investigates this for a sample of concerts during one year.

(a) Write down a hypothesis Zoe can use.

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(1)

(b) Write down two variables Zoe needs to use.

Variable 1

Variable 2

(2)

(Total for question = 3 marks)

Q10.

Ruchi is investigating the relationship between an athlete's height and the time the athlete takes to run 100 metres.

Suggest a hypothesis she could use to investigate this.

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(1)

(Total for question = 1 mark)

Q11.

Julie was investigating the relationship between the marks gained by students in their GCSE Mathematics exam and the marks gained by the same students in an A-level Mathematics exam.

Suggest a hypothesis Julie could use.

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(1)

(Total for question = 1 mark)

Q12.

Youssef is investigating the amount of time students spend on social media.

Here is what Youssef has written down for his hypothesis and how he plans to collect, process and present his data.

<p>Hypothesis</p> <ul style="list-style-type: none">• Do girls spend more time than boys on social media? <p>Data to collect</p> <ul style="list-style-type: none">• Gender of student• Time spent on social media in one week (using categories: 1–2 hrs, 3–4 hrs, 5–6 hrs)• Name of student <p>Processing and presenting data</p> <ul style="list-style-type: none">• Work out an estimate of the mean weekly time boys spend on social media• Work out an estimate of the mean weekly time girls spend on social media• Draw a scatter graph with gender on the horizontal axis and time spent on social media on the vertical axis• Draw a time series graph showing how the amount of time spent on social media has changed over the years
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Discuss whether Youssef's hypothesis and his plans for collecting, processing and presenting his data are appropriate.

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(Total for question = 5 marks)