

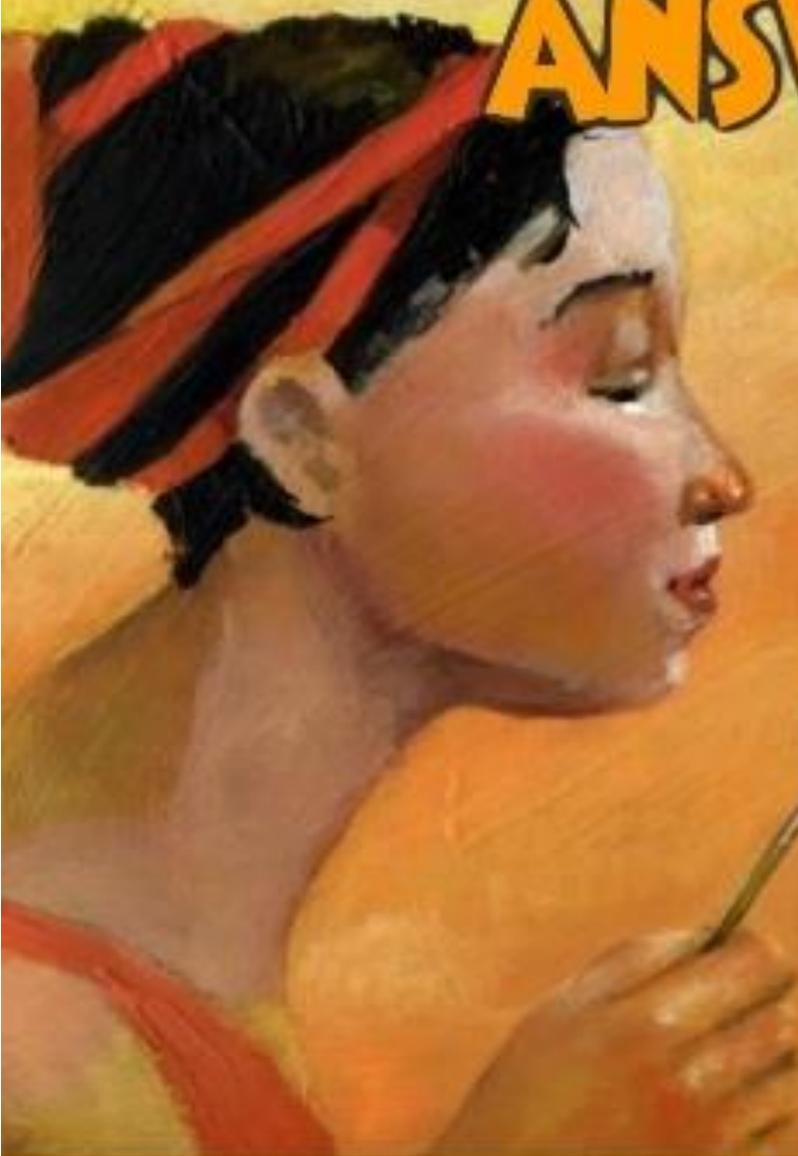
Level 4



MATHS ASSIGNMENT 4

Data Handling

ANSWERS



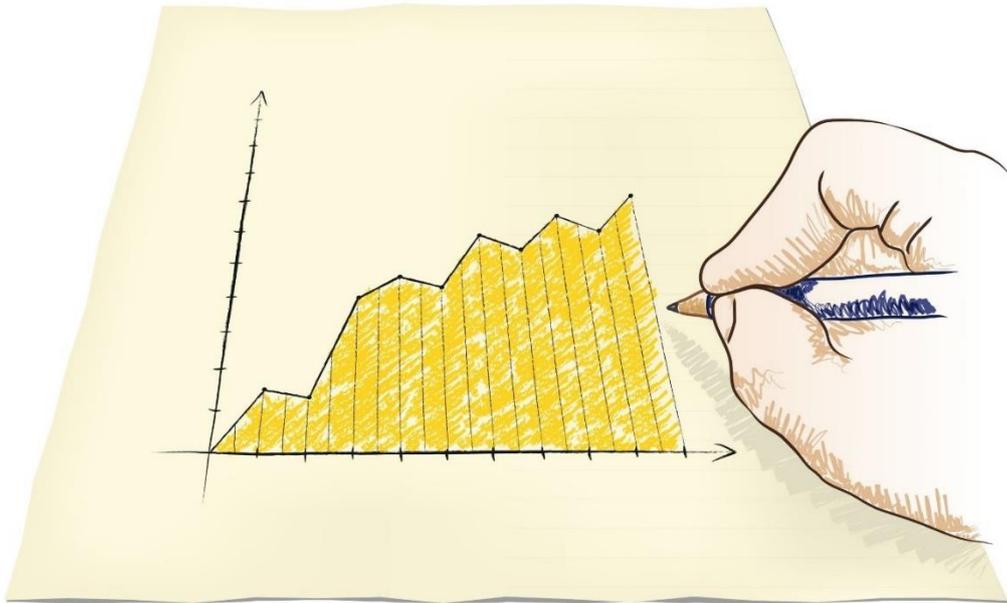
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MATHEMATICS

QQI Level 4 (4N1987)

Assignment 4 – DATA HANDLING



INSTRUCTIONS TO THE CANDIDATES

1. Enter your name below.
2. Complete the questions in the space provided.
3. Extra space is available at the back of this document if required.
4. Use of a scientific calculator is allowed.
5. Formulae are provided separately.
6. Include units in your answers, where applicable.
7. Show all working out.
8. Answers must be written correct to 2 decimal places.
9. Include all rough work at the end of your portfolio.

Name: _____
Date: _____

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ASSESSMENT BRIEF 4

Component title:	Mathematics
Component code:	4N1987
Assessment technique:	Assignment
Assessment title:	Data Handling
Assessment number:	4
Weighting:	20%

Guidelines:

You will be expected to:

1. Explain basic statistical concepts to include population, sample, dependent, independent and discrete variables
2. Present information from data collected from the world wide web or other methods, in graphical and tabular form, including bar charts, pie charts, trend graphs, cumulative frequency curves, histograms and frequency tables
3. Calculate the statistics for measuring averages and dispersion of an array of data, to include calculating the mean, mode, and median
4. Discuss findings, to include interpretation of results, and suggesting reasons for finding

Assessment criteria:

In completing your assignment, you must do the following:

- make at least three calculations for each of the following – mean, median, mode and weighted average of given data
- tabulate at least three examples of given data
- present at least three sets of data in a range of graphical forms
- use a calculator correctly in scientific mode
- round decimals as appropriate
- correctly substitute formulae as required
- obtain an accurate answer
- adhere to mathematical precedence rules
- correctly apply mathematical concepts to real-life situations
- use terminology correctly
- use mathematical symbols and letters correctly
- set out work in a format demonstrating a logical progression of thought
- present and lay out work clearly

Your assignment will be assessed in the following way:

Statistical concepts – 20 marks

Calculating statistics – 20 marks

Presenting information – 20 marks

Interpreting data - 20 marks

TOTAL: 80 marks ÷ 4 = 20 marks

Marks will be deducted from the total for each question on the assignment, for example, for:

- Incorrect/illogical layout
- Omitting units of measurement in final answers
- Answers not correct to 2 decimal places, where applicable
- More than 2 attempts
- Blunders - mathematical errors/omissions



- Slips - numerical errors
- Misreadings

Marks may be deducted for late submission.
Note: Discussions may be recorded.

There may be questions on the assignment which do not carry marks but will assist you with examination preparation. It is in your best interests to complete these.

Date brief was issued: _____

Submission date: _____

I confirm that this is my original work.

Signed: _____

Date: _____





**STATISTICAL
CONCEPTS**



STATISTICAL CONCEPTS

Discrete Data

Discrete Data can only take certain values. Example: the number of students in a class – there can't be half a student! Another example: The results of rolling 2 dice can only have the values 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12.

Continuous Data

Continuous Data can take any value (within a range) Example: A person's height could be any value (within the range of human heights!). Another example: The time in a race could even be measured to fractions of a second.

1. For each of these types of data, state whether the data is discrete or continuous:

- a) The number of students in the café - discrete
- b) The number of tickets sold at a concert - discrete
- c) The time taken to get from home to the shops - continuous
- d) The time taken for athletes to complete a race - continuous
- e) The number of chocolates in various 500g boxes - discrete



Numerical data

These data have meaning as a measurement, examples: a person's height, weight, IQ, blood pressure; or they're a count, such as the number of pets a person owns, how many teeth a dog has, or how many pages you can read of your book every day. (Statisticians also call numerical data quantitative data.) Numerical data can be further broken into two types: discrete and continuous.

Categorical data

Categorical data represent characteristics such as a person's gender, marital status, hometown, or the types of movies they enjoy. Categorical data can take on numerical values (such as "1" indicating male and "2" indicating female), but those numbers don't have mathematical meaning. You couldn't add them together, for example. (Other names for categorical data are qualitative data, or Yes/No data.)

2. For each of these types of data, state whether the data is categorical or numeric



(2 marks)

- a) Travel methods to class - categorical
- b) Heights of students - numerical
- c) Favourite type of music - categorical
- d) Time taken to complete a quiz - numerical
- e) Number of adults in a household - numerical



3. Read the table:

BASIS FOR COMPARISON	PRIMARY DATA	SECONDARY DATA
Meaning	Primary data refers to the first-hand data gathered by the researcher (himself/herself).	Secondary data means data collected by someone else earlier.
Data	Real time data	Past data
Process	Very involved	Quick and easy
Source	Surveys, observations, experiments, questionnaire, personal interview, etc.	Government publications, websites, books, journal articles, internal records etc.
Cost effectiveness	Expensive	Economical
Collection time	Long	Short
Specific	Always specific to the researcher's needs.	May or may not be specific to the researcher's need.
Available in	Crude form	Refined form
Accuracy and Reliability	More	Relatively less

4. What is primary data? Give one example of how it may be obtained:

First-hand data gathered by the researcher
Real-time data
Specific to the researcher's needs
Often in crude form
Examples: surveys, observations, experiments, questionnaire, personal interview, etc.



5. What is secondary data? Give an example of where it may be obtained:



Data collected by someone else earlier
Past data
May or may not be specific to the researcher's need
Refined form
Examples: government publications, websites, books, journal articles, internal records etc

(2 marks)



Dependent and independent variables

An independent variable is a variable that is being manipulated in an experiment in order to observe the effect on a dependent variable.

Imagine that a teacher asks 100 students to complete a maths test. The teacher wants to know why some students perform better than others. Whilst the teacher does not know the answer to this, the teacher thinks that it might be because of two reasons: (1) some students spend more time revising for their test; and (2) some students are naturally more intelligent than others. As such, the teacher decides to investigate the effect of revision time and intelligence on the test performance of the 100 students.

The dependent and independent variables for the study are:

- Dependent Variable: Test Mark (measured from 0 to 100)
- Independent Variables: Revision time (measured in hours) Intelligence (measured using IQ score)

The dependent variable is a variable that is dependent on an independent variable(s).

Example: In the case above, the test mark that a student achieves is dependent on revision time and intelligence. Whilst revision time and intelligence (the independent variables) may (or may not) cause a change in the test mark (the dependent variable), the reverse is implausible; in other words, whilst the number of hours a student spends revising and the higher a student's IQ score may (or may not) change the test mark that a student achieves, a change in a student's test mark has no bearing on whether a student revises more or is more intelligent (this simply doesn't make sense)!!!

Therefore, the aim of the teacher's investigation is to examine whether these independent variables - revision time and IQ - result in a change in the dependent variable, the students' test scores.

6. Give an example of dependent and independent variables in a particular survey.

Phenomenon: climate change

Examples of variables related to climate change:

sea level

temperature

the amount of carbon emission

the amount of rainfall

In this example: temperature (independent variable) may influence sea level (dependent variable). Increased temperature will cause expansion of water in the sea. Thus, sea level rise on a global scale may occur.

(2 marks)





RESEARCH

7. Describe the word 'population' in statistics:

In statistics, the term population is used to describe the subjects of a particular study—everything or everyone who is the subject of a statistical observation. Populations can be large or small in size and defined by any number of characteristics, though these groups are typically defined specifically rather than vaguely, e.g., a population of students over 18 who drink coffee rather than a population of students over 18.

Statistical populations are used to observe behaviours, trends, and patterns in the way individuals in a defined group interact with the world around them, allowing statisticians to draw conclusions about the characteristics of the subjects of study, although these subjects are most often humans, animals, and plants, and even objects.

8. What is a sample in statistics?

In statistics, you'll be working with samples. A sample is just a part of a population. For example, if you want to find out how much the average person in Ireland earns, you aren't going to want to survey everyone in the population (millions of people!), so you would choose a small number of people in the population. For example, you might select 10,000 people.

9. How is sample size important?

Sample size is a count of the of individual samples or observations in any statistical setting, such as a scientific experiment or a public opinion survey. Choice of sample size is a critical determination for a project. Too small a sample yields unreliable results, while an overly large sample demands a good deal of time and resources.

Sample size measures the number of individual samples measured or observations used in a survey or experiment. For example, if you test 100 samples of water for evidence of bacteria, your sample size is 100. If an online survey returned 30,900 completed questionnaires, your sample size is 30,900. In statistics, sample size is generally represented by the variable "n".

(3 marks)



CARRYING OUT A SURVEY

1. Why should we do statistics? Give some real-life examples of how we can use surveys as tools.

The purpose of official statistics is to assist state departments, businesses, other organisations or the public in—

- (a) planning;
- (b) decision-making or other actions;
- (c) monitoring or assessment of policies, decision-making or other actions.

Statistics is the science of collecting, analysing and making inference from data. It is a particularly useful branch of mathematics that is not only studied theoretically by advanced mathematicians but one that is used by researchers in many fields to organize, analyse, and summarise data. Statistical methods and analyses are often used to communicate research findings and to support hypotheses and give credibility to research methodology and conclusions. It is important for researchers and also consumers of research to understand statistics so that they can be informed, evaluate the credibility and usefulness of information, and make appropriate decisions.

The first part of the planning process is to identify the objectives of your survey or what you want to find out.

2. As a group, talk about these survey topics. Tick those you think are good topics. (Remember, you would have to break your survey up into questions!)

Student's Answers

- How do you use the Internet?
- What do you do to protect the environment?
- What is great about Ireland?
- Which newspaper is the best?
- What superstitions do you have?
- What pets do you have at home?
- What is the best TV channel?
- What is your favourite place in your home?
- Can mobile phones be educational?
- What is your favourite day of the year?
- Are restaurants serving healthy food?
- How many people use public transport?



(Practice)



3. As a group, brainstorm what survey you can carry out. Write a few ideas below:

Student's answers

4. What topic did the group decide on?

Student's answers

5. What are the group's objectives?

Student's answers

6. Decide on the methods you will use to obtain the information. Write some possibilities below:

Interviews – by telephone or in person

Questionnaires and surveys – paper-based and online

Observations

Focus Groups

Case Studies

Documents and Records, e.g. databases, meeting minutes, reports, attendance logs, financial records, newsletters, etc.

7. Design your survey. Include a rough draft with your portfolio.

Key things to consider when designing a survey:

- Keep it as short as possible; it should take no longer than 10 minutes to complete.
- Use plain, simple language and avoid jargon.
- Use a mixture of open and closed questions.
- Use clear headings and numbers to structure your survey.
- Make sure to use an easy to read font such as Arial and at least font size 12.
- Make sure that the survey will fulfil your objective/s!

8. Type up your survey method, e.g. questionnaire.

(Practice)





Keep a record of how many people you have approached to take part, as this will help you to calculate your overall response rate. Try to get a spread across roles, length of experience, age and gender, if possible. It is important that you keep your sampling technique consistent and open; not just picking those who you would prefer to include.

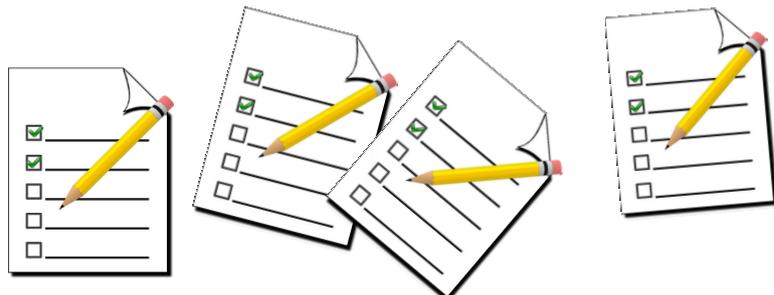
9. Comment on population, sample and sample size **Student's answers**

10. Decide how long you have to carry out the work and set a time frame for the design, distribution and analysis of results.

Date to be completed by	Task to be completed
Student's answers	Student's answers

11. Carry out your survey. Each student can take a few copies to hand out to family and friends to fill them in, if it is a questionnaire. You could also send an online link or send them by email. **Student's answers**

(2 marks)





13. Analyse the data and your findings. Write your findings below.

Student's answers

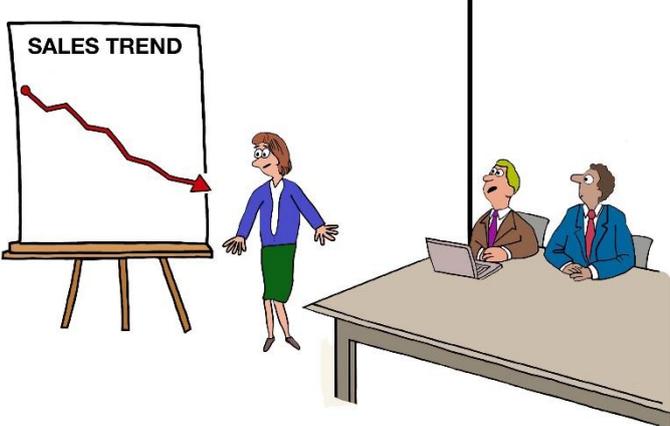
(3 marks)

Once your survey has been completed and you have analysed your results it is important to present and publicise the findings. This can be done in a number of ways:

- A summary sheet highlighting the main findings
- A brief report
- Information session with group members and tutor / teacher
- A presentation

14. Present your results.

(3 marks)



"I wouldn't stand there, if I were you."



**CALCULATING
STATISTICS**



MEAN

1. Read the information:

The mean of a set of data is the average.
Add up all of the data.
Divide the sum by the number of data items you have.

Example: Find the mean: 4, 16, 20, 40
First, add. $4 + 16 + 20 + 40 = 80$
There are 4 items. Divide the sum (80) by 4.
The mean is 20.

- a) Give another term for the word **mean**. average
b) Susie scored 98, 25, 105, 62 and 65 in 5 tests. What was the mean score per test?

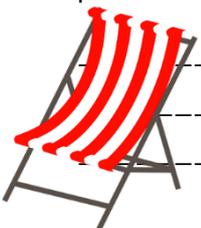
71

- c) Jack earns €100 on the first day, €60 on the second day, €150 on the third day, €80 on the fourth day and €90 on the fifth day. Calculate the means of his earnings. **€96**



- d) Four students took varying times as follows to fill in a form: 25 seconds, 1 minute, 57 seconds and 1 min 15 seconds. Calculate the mean of these times (to the nearest second). **54.25 seconds**

- e) The temperatures we had on holiday in Spain during a week were 35° C, 36° C, 34° C, 38° C, 40° C, 39° C and 44° C. What was the average daily temperature of the place for the week? **38° C**



(2 marks)



MEDIAN

1. Read the information:

The median is the data point that is in the middle when the data is listed in order. If there are two numbers in the middle (an even number of items), then find the mean of the two middle numbers.

Examples:

Find the median: 13, 16, 17, 19, 25
17 is the median.

Find the median: 3, 5, 6, 9
Here, the 5 and 6 are both in the middle. $5 + 6 = 11$. 11 divided by $2 = 5.5$.
The median is 5.5.

a) Find the median of 23, 27, 16, 31. **25**

b) Find the median of 7, -4, 9, -7, -2, 5. **1.5**

c) Find the median of 2, 10, 5, 6, 10, 4, 4, 2, 8, 12, 6, 4, 2. **5**

d) Find the median of 54, 45, 44, 55, 45, 54, 44, 55, 54. **54**

e) Find the median of 12, 8, 10, 5, 12, 9, 6, 1, 12. **9**

f) Find the median of 3.5, 3.1, 3.1, 3.3, 3.6, 3.1, 3.4, 3.2. **3.25**

(2 marks)



MODE

1. Read the information.

The mode is the data item that appears the most. If all data items appear the same number of times, then there is no mode.

Example:

Find the mode.

5, 4, 6, 11, 5, 7, 10, 5

The mode is 5.

a) 8, 11, 9, 14, 9, 15, 18, 6, 9, 10

9

b) 7, 13, 18, 24, 9, 3, 18

18

c) In a crash test, 11 cars were tested to determine what impact speed was required to obtain minimal bumper damage. Find the mode of the speeds given in kilometres per hour below.

24, 15, 18, 20, 18, 22, 24, 26, 18, 26, 24 **The modes are 18 and 24 kilometres per hour.**

d) A marathon race was completed by 5 participants. What is the mode of these times given in hours?

2.7 hr, 8.3 hr, 3.5 hr, 5.1 hr, 4.9 hr **There is no mode.**

e) On a cold winter day in January, the temperature for 9 North American cities is recorded in Celsius. What is the mode of these temperatures?

-8, 0, -3, 4, 12, 0, 5, -1, 0 **The mode of these temperatures is 0.**

(2 marks)





MEAN, MEDIAN AND MODE

1. The amounts of money spent by 9 tables at a restaurant were as follows:

€30, €45, €42, €35, €86, €86, €48, €51, €36

Calculate the mean, median and mode for this data.

Mean - 51 Median is 45 Mode - 86



2. This is how many kilometres the students ran to practise for the marathon.

25, 93, 97, 72, 14, 44, 21, 39, 98, 27

Calculate the mean, median and mode for this data. **Mean - 53, Median - 41.5, Mode**

- None

(2 marks)



WEIGHTED AVERAGE

The formula for working out weighted average is:

$$\bar{x}_w = \frac{\sum wx}{\sum w}$$

Σ - is the Greek capital letter sigma, which means 'the sum of'

\bar{x}_w - is short for 'weighted mean'

x is the value of each measurement

w is the weight attached to each measurement

1. A class of 25 students took a maths test. 10 students had an average (arithmetic mean) score of 80. The other students had an average score of 60. What is the average score of the whole class?

$$80 \times 10 + 60 \times 15 = 800 + 900 = 1700$$

$$\text{Total number of terms} = \text{Total number of students} = 25$$

Using the formula

$$\text{Weighted average} = (\text{Sum of weighted terms}) \div (\text{Total number of terms})$$

$$= 1700 / 25$$

$$= 68$$

The average score of the whole class is 68.

(2 marks)





A BAR GRAPH

1. Read the information:

A bar graph uses vertical or horizontal bars to display numerical information.

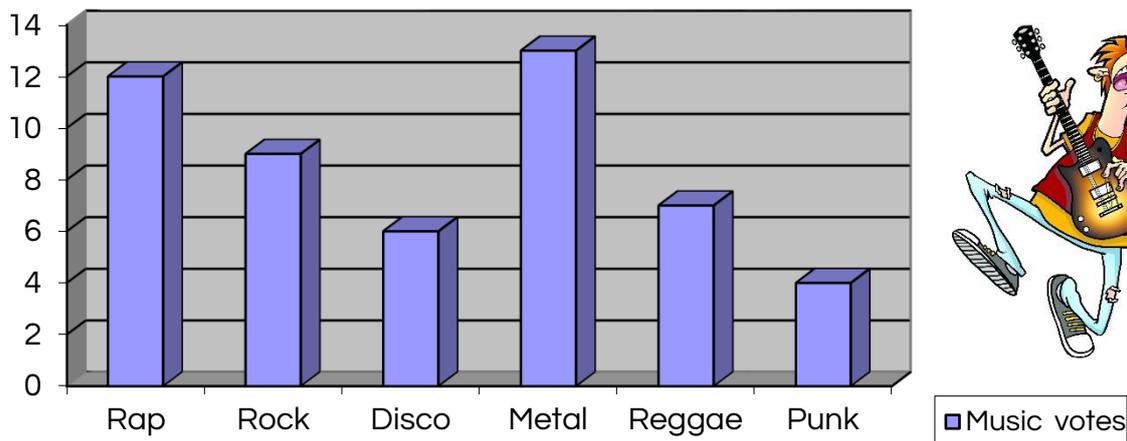
Bar graphs can be used to compare amounts.

Choose an appropriate scale (with regular intervals).

The bars should have the same width.

2. Look at the following bar graph and answer the questions:

THE MUSIC CLUB



a) Name the most popular music in the pub. metal

b) Which type of music got 7 votes? reggae

c) Name the least popular type of music. punk

d) Name the number of members in the club. 51

(1 mark)



PIE GRAPH

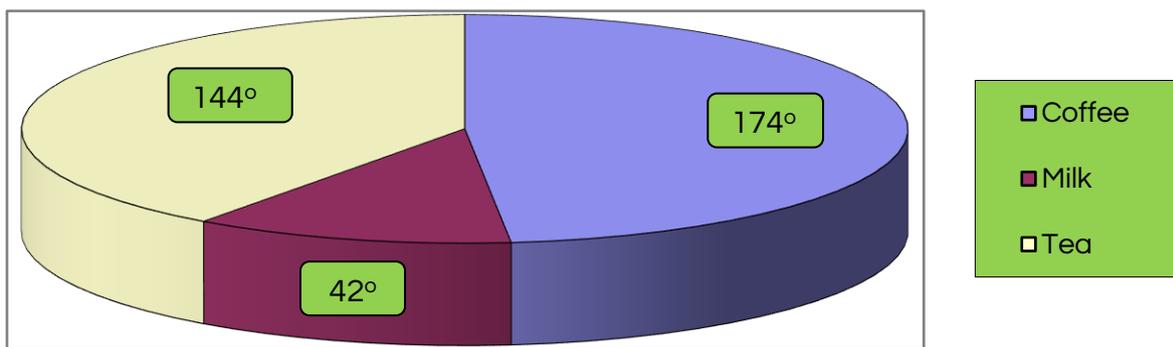
1. Read the information:

A pie graph is a graph of data that is presented in a circle, where the entire circle represents the whole (100%).

Each wedge represents a part of the whole.

60 people use the hot drinks machine at work. Look at the pie graph and answer the questions.

HOT DRINKS



a) How many bought tea?

24

b) How many bought coffee?

29

c) How many bought milk?

7

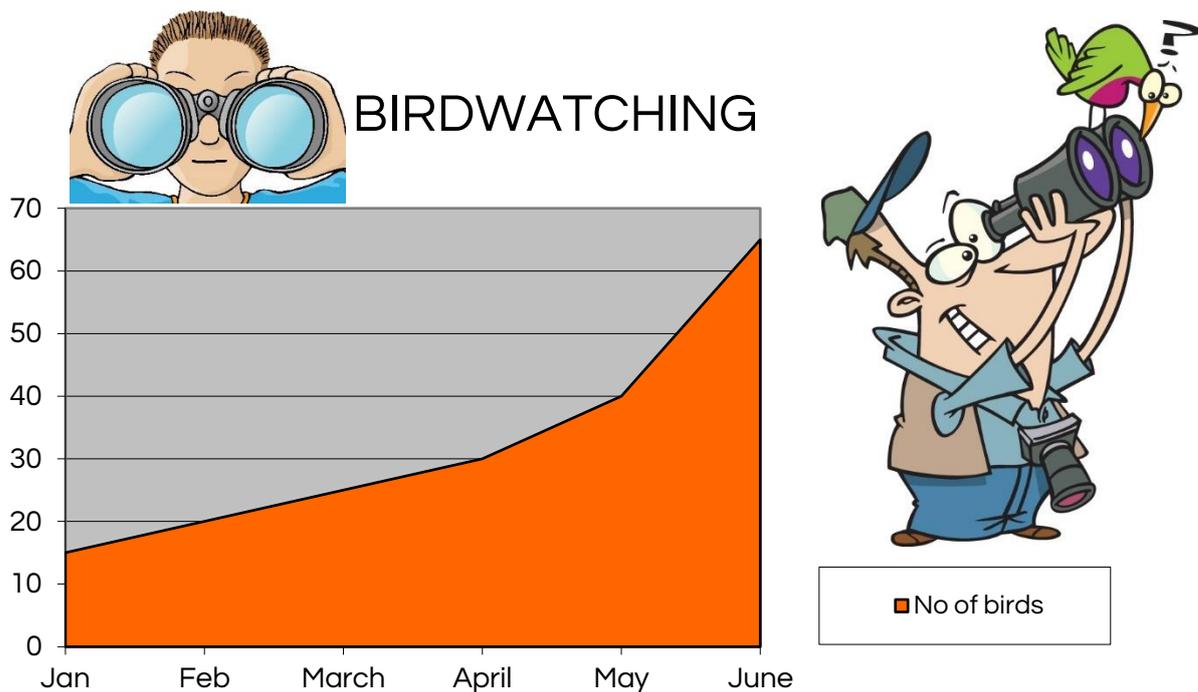
(3 marks)



TREND GRAPH

Trend charts are also known as run charts and are used to show trends in data over time.

1. The number of bird species spotted at a reserve is as follows. Look at the graph and answer the questions.



- a) How many bird species were spotted in May? 40 species
- b) In which months were 50 or more species spotted? May, June
- c) In which month were the least number of species spotted? January
- d) What is the difference in the number of species spotted between the 1st and last month recorded? 50 species

(1 mark)



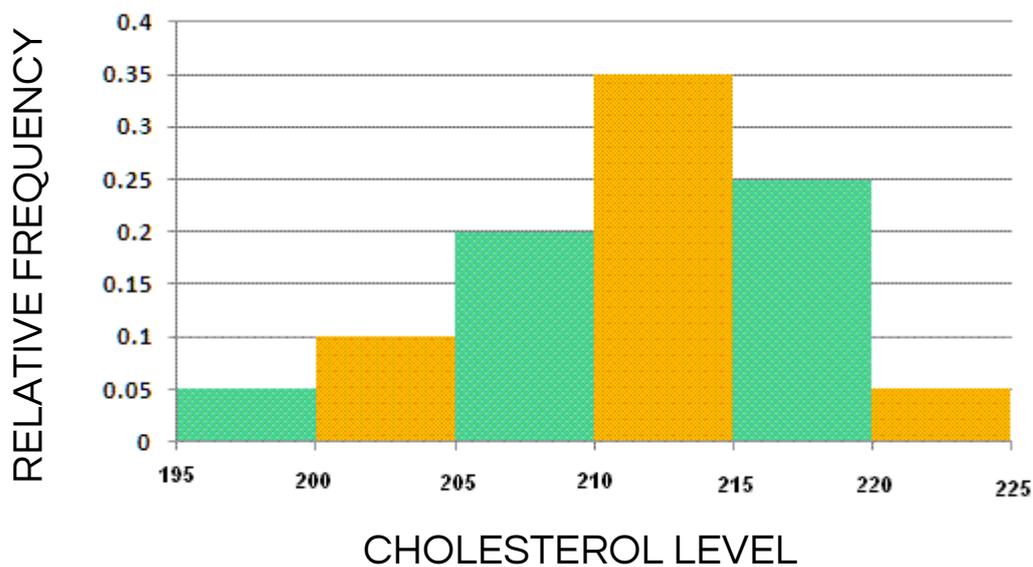
HISTOGRAM

A histogram is a bar graph that shows the frequency of each item. Histograms combine data into equal-sized intervals.

There are no spaces between the bars on the histogram.

The histogram below shows the level of cholesterol (in mg per dl) of 200 people.

1. Look at the graph below:



2. Answer the questions:

a) How many people have a level of cholesterol between 205 and 210 mg per dl?

$0.2 \times 200 = 40$ people

b) How many people have a level of cholesterol less than 205 mg per dl?

$(0.05 + 0.1) \times 200 = 30$ people

c) What percentage of people have a level of cholesterol more than 215 mg per dl?

$(0.25 + 0.05) = 0.3 = 30\%$

d) How many people have a level of cholesterol between 205 and 220 mg per dl?

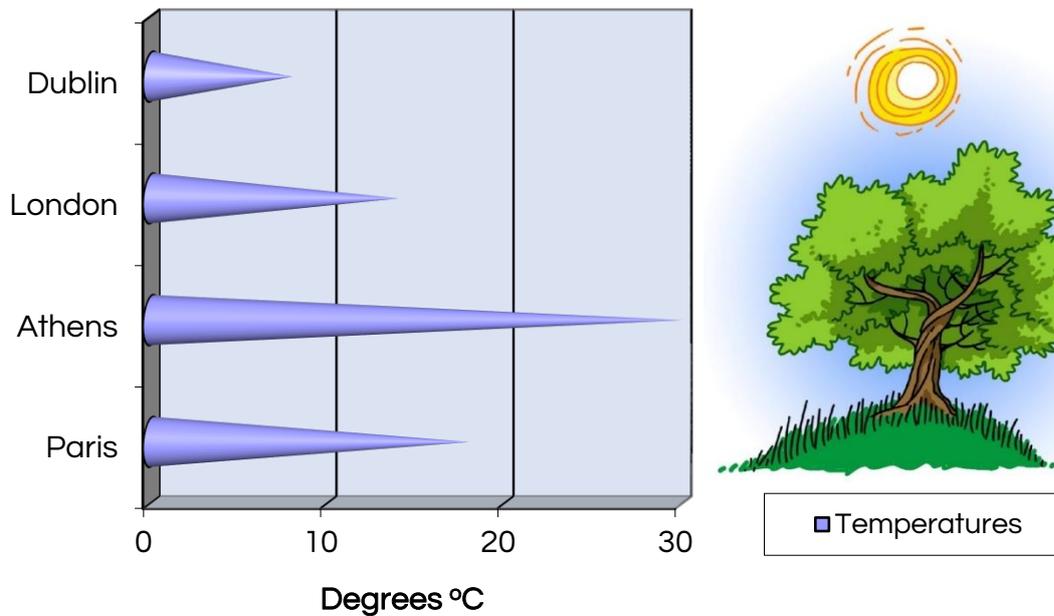
$(0.2 + 0.35 + 0.25) \times 200 = 160$ people

(2 marks)



OTHER GRAPHS

1. The following chart shows the temperature in degrees Celsius in four cities at noon on one day.



- a) Which city had the highest temperature? Athens
- b) What is the difference in temperature between the hottest and coolest cities?
About 23°C
- c) Find the mean temperature of the four cities at noon on that day.
16.25°C, or close to this answer
- d) Write one fact from the table below.

Temperatures on 23 rd March at 22.30					
Lisbon	Athens	Moscow	Oslo	Cork	Zurich
11°C	16°C	5°C	-2°C	9°C	5°C

- Example: Athens was 18°C higher than Oslo.
- (1 mark)



**PRESENTING
INFORMATION**



RESEARCH

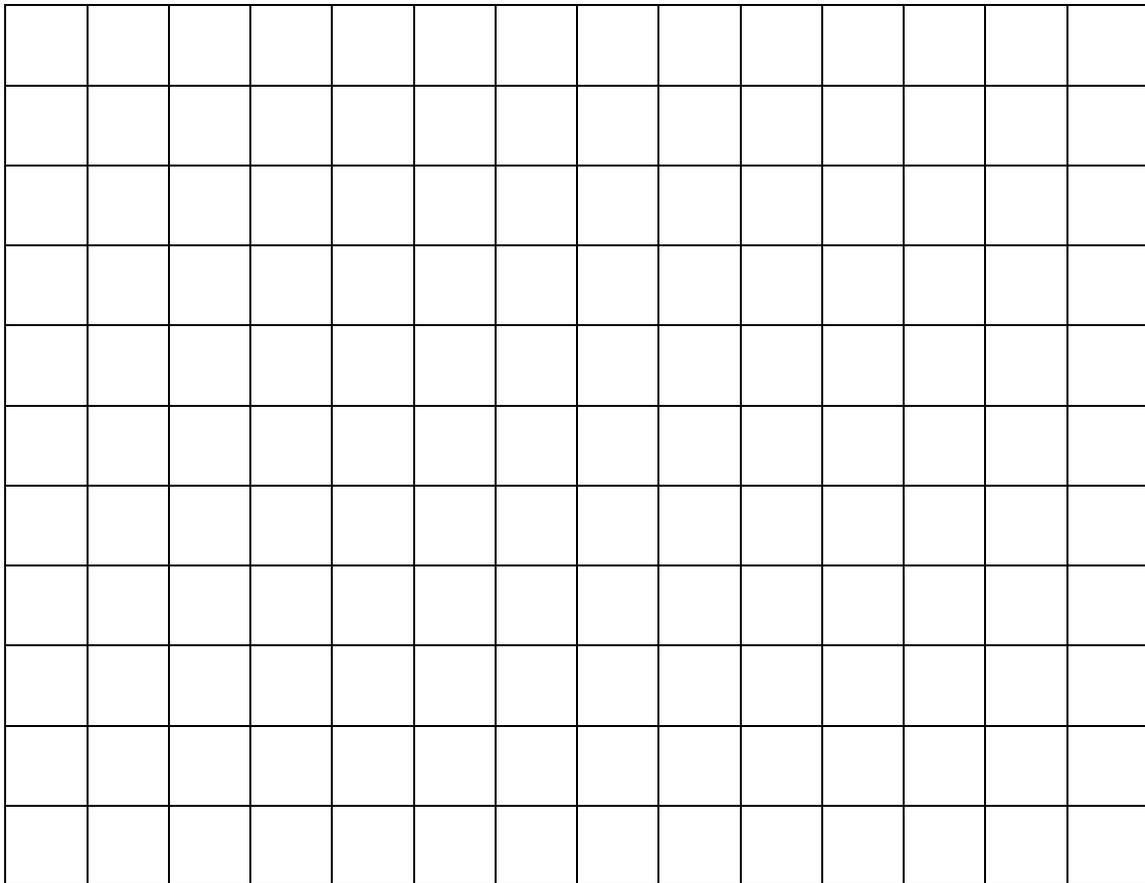
DRAWING YOUR OWN GRAPHS

1. Look at the average temperatures of a six-month period in Ireland. Carry out research, e.g. online at Met Éireann. Fill in the results in the table below. Which months and year did you choose? _____

Month	1	2	3	4	5	6
Temperature						

2. Construct a trend graph for this data.

Student's answers



(3 marks)





3. Research the average amount of water used daily in a household. You can compare different countries, different cities or even different students! Use at least five sets of data. You can do a quick survey in class, search online or use any other means of collecting the data and finding the information. (You can use a water calculator online to see how much water you use) Fill in the table below:

Litres of Water (1000's)					



Student's answers

4. Construct a bar graph for this data.



(3 marks)



MATHS 4, ASSIGNMENT 4: DATA HANDLING

- Find the Top 5 of a product in Ireland, e.g. Top selling cars, Top selling chocolates, Top selling mobile phones, etc. You choose!
- Carry out your research, e.g. questionnaire, survey, online research, interviews, etc.
- Write your findings below in rough:

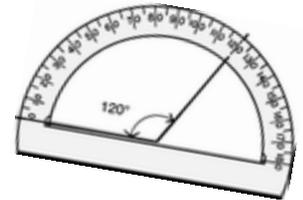


Student's answer _____

	Product	Data	%
1st			
2nd	Student's answers		
3rd			
4th			
5th			

- Construct a pie graph to represent this data. You must use a key.

Student's answer



(4 marks)



FREQUENCY TABLE

1. Read the information:

In a survey, people usually collect lots of data, also known as raw data. Raw data can be arranged in a frequency table.

A frequency table shows the number of times each value occurs. The mode is the data with the highest frequency.

Example: Construct the frequency table for the following.

4, 3, 6, 5, 2, 4, 3, 3, 6, 4, 2, 3, 2, 2, 3, 3, 4, 5, 6, 4, 2, 3, 4

X	2	3	4	5	6
Y	5	7	6	2	3

2. Construct the frequency table for the following.

6, 7, 5, 4, 5, 6, 6, 8, 7, 9, 6, 5, 6, 7, 7, 8, 9, 4, 6, 7, 6, 5

X	4	5	6	7	8
f	2	4	7	5	2



The pulse rate (per minute) of 25 persons were recorded as follows:

61, 75, 71, 72, 70, 65, 77, 72, 67, 80, 77, 62, 71, 74, 79, 67, 80, 77, 62, 71, 74, 61, 70, 80, 72, 59, 78, 71, 72.

3. Construct a frequency table expressing the data in the inclusive form taking the class interval 61-65 of equal width.

C.I.	56 - 60	61 - 65	66 - 70	71 - 75	76 - 80
Frequency	1	4	4	10	6

(2 marks)



4. A maths teacher wants to organise the test marks of the class. The students earned the following marks:

88, 86, 92, 65, 72, 75, 81, 84, 85, 93, 99, 50, 78, 80, 86, 76, 74, 95, 81, 87, 90, 72, 76, 61, 85, 84, 78, 83



Grades are determined by percent where 0-59% is an F, 60-69% is a D, 70-79% is a C, 80-89% is a B, and 90-100% is an A. These values make the most logical intervals. Intervals are always chosen depending on the range of the data. Make a frequency table to illustrate the information.

Frequency Tables of Marks

Interval	Tally	Frequency
90 - 100	XXXXX	5
80 - 89	XXXXXXXXXXXX	12
70 - 79	XXXXXXXX	8
60 - 69	XX	2
0 - 59	X	1



RESEARCH

5. How many cups of tea do you drink every day? Carry out research to discover how many cups of tea the average person drinks per day. Make your sample size 20. (For people who drink more than 4 cups, use 4+)



Fill in your frequency table below:

Number of cups of tea each person drinks														
Student's answer														

Represent the information on a frequency table.

Number of cups (x)	Tally	Frequency (f)

(3 marks)



CUMULATIVE FREQUENCY CURVES



RESEARCH

1. Research online and watch some videos on how to draw a cumulative frequency curve.
2. Draw a cumulative frequency graph for the frequency table below.

Length (xmm)	Frequency
11 – 15	2
16 – 20	4
21 – 25	8
25 – 30	14
31 – 35	6
36 – 40	4
41 – 45	2

We need to add a class with 0 frequency before the first class and then find the upper boundary for each class interval.

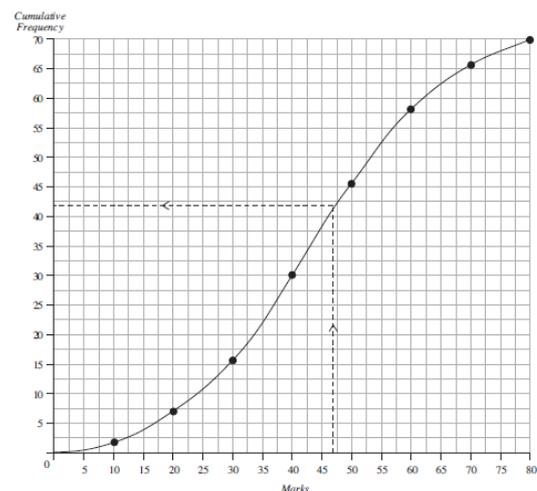
Length (xmm)	Frequency	Upper Class Boundary	Length (xmm)	Cumulative Frequency
6 – 10	0	10.5	$x \leq 10.5$	0
11 – 15	2	15.5	$x \leq 15.5$	2
16 – 20	4	20.5	$x \leq 20.5$	6
21 – 25	8	25.5	$x \leq 25.5$	14
25 – 30	14	30.5	$x \leq 30.5$	28
31 – 35	6	35.5	$x \leq 35.5$	34
36 – 40	4	40.5	$x \leq 40.5$	38
41 – 45	2	45.5	$x \leq 45.5$	40

3. Plot the cumulative frequency against the upper class boundary of each interval and join the points with a smooth curve. (over the page)

This is what a cumulative frequency graph

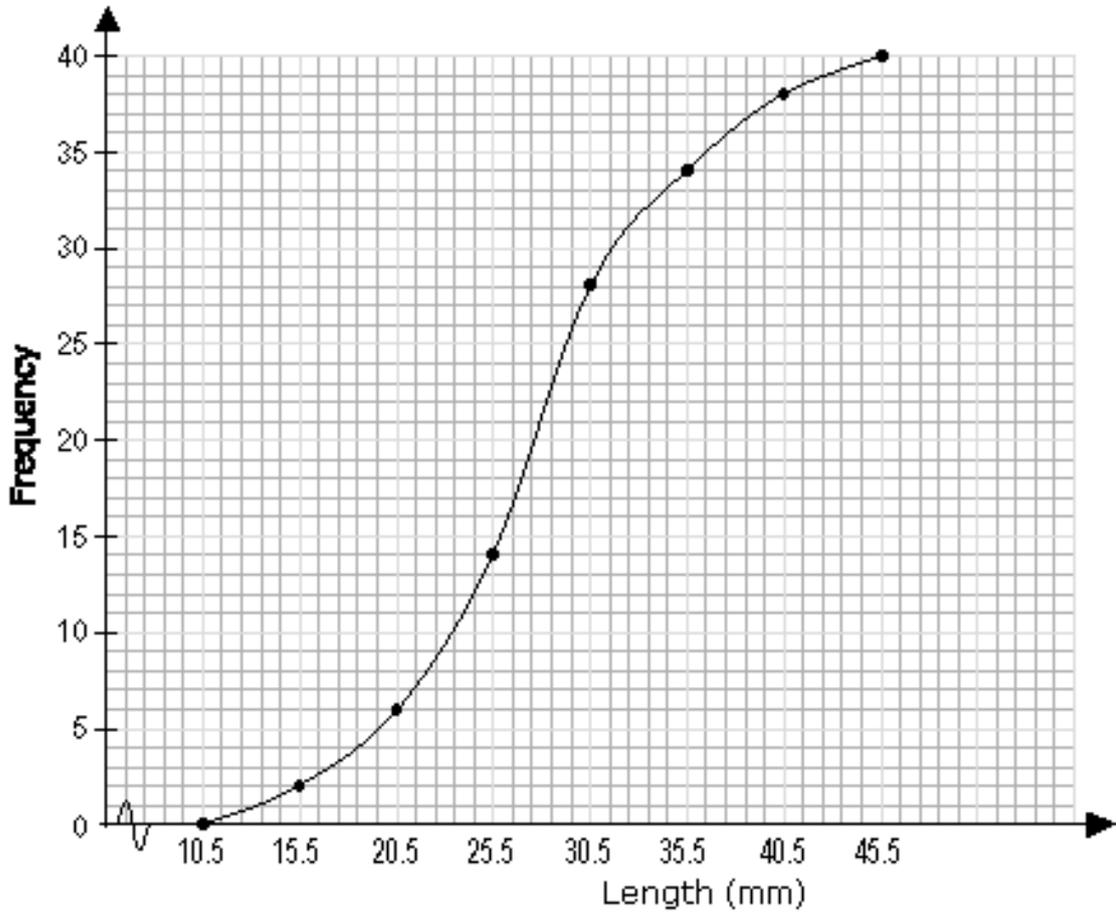
looks like! →

(3 marks)





Should look similar to this:



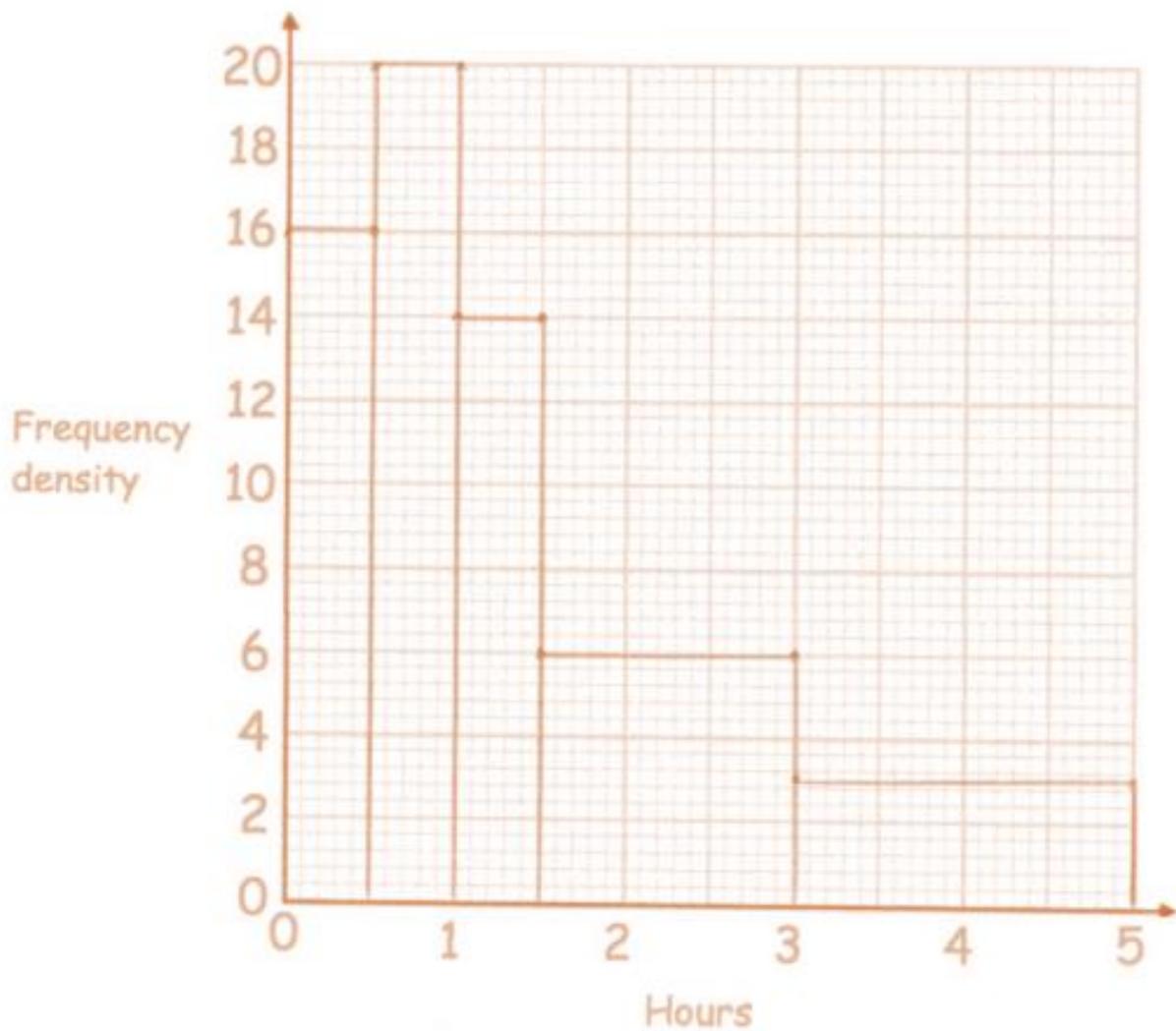


HISTOGRAM

1. The waiting times, h hours, for 40 patients in Accident & Emergency in one day is shown below. Draw a histogram for this data.

Waiting time, h	Frequency
$0 < h \leq 0.5$	8
$0.5 < h \leq 1$	10
$1 < h \leq 1.5$	7
$1.5 < h \leq 3$	9
$3 < h \leq 5$	6

Should look similar to below:



(2 marks)



INTERPRETING

DATA



1. Hold a discussion about statistics.



RESEARCH

Look at statistics online and discuss the data, your findings and possible reasons for your findings. Do this as a discussion and explore the possibilities.

Student discussion

Examples of statistics you could look at: (See the Central Statistics Office – www.cso.ie)



An Phríomh-Oifig Staidrimh Central Statistics Office

- Populations in different towns / counties in Ireland
- Tourism in Ireland
- The wellbeing of the nation
- Earnings per week, etc.
- Choose statistics that the group is interested in

Also talk about:

- The purpose of statistics
- The misuses of statistics
- The idea of samples (sample size, simple random sample) in relation to population
- Different ways that information can be presented – (graphically, in tables) and the uses of representing data graphically
- The effectiveness of different graphical displays

Your discussion will be
recorded!

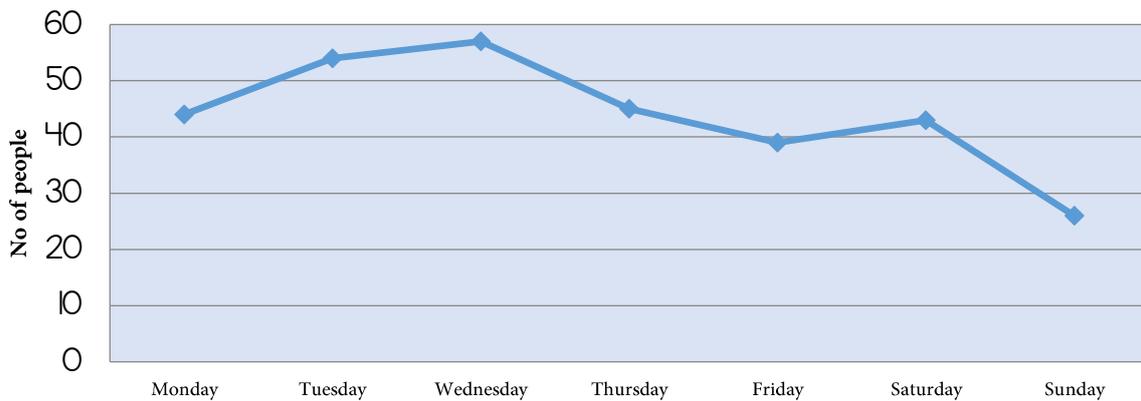
(3 marks)





2. A survey was carried out about which day most people like to go to a business lunch. This graph shows the results:

Most Popular Day for Business Lunch

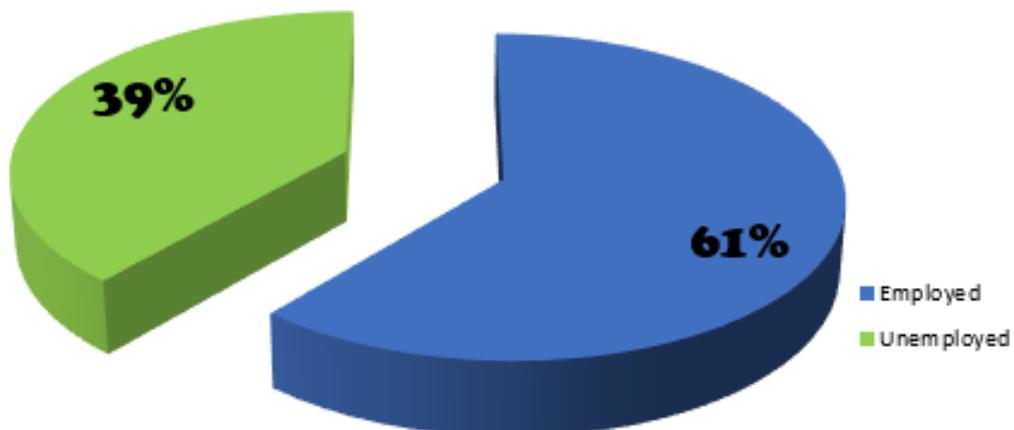


3. Write three findings.

Example: These findings represent the most popular day for going out to a business lunch. The findings show that Wednesday is the most popular day with a total of about 58. The reason for this could possibly be that this is mid-week, and people want to get out of work for a while! The least popular day is Sunday, with a total of about 25. This is probably because most people do not conduct business on a Sunday. Monday has a total of about 45. Often people are getting back to work after the weekend, and they may be too busy to go out for lunch.

4. Look at this graph and give it a suitable title:

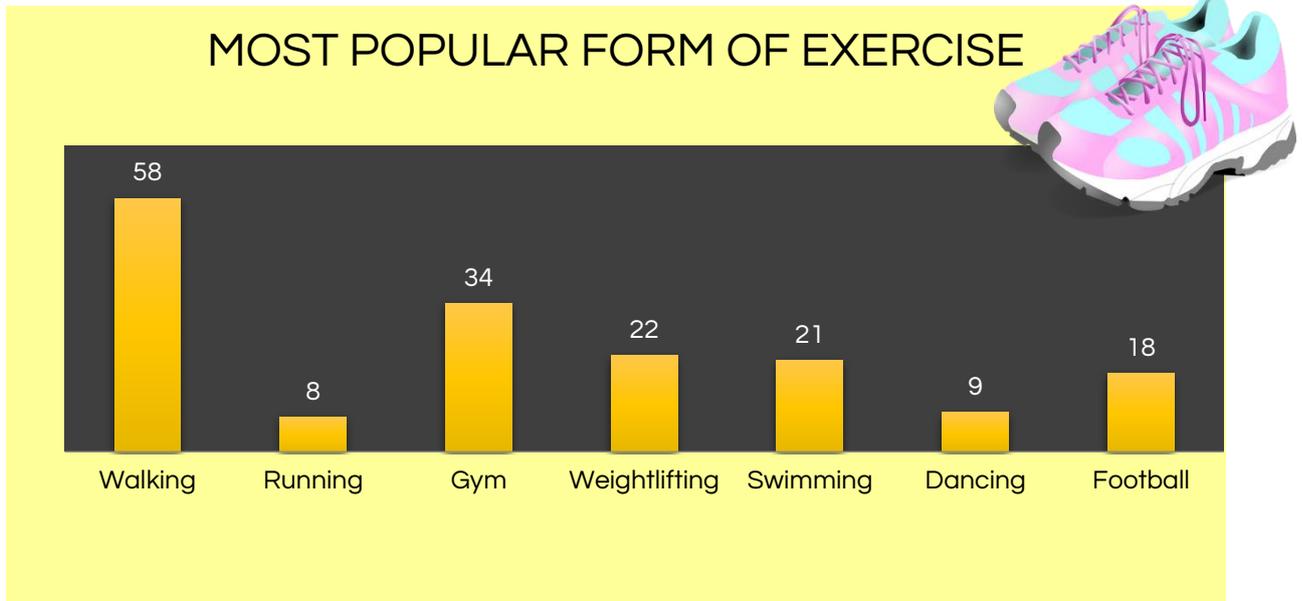
GRAPH TITLE: Example: Employment Statistics



(4 marks)



5. Look at the findings of this survey and write a short piece about what sports students should have access to in their centre. Include the possible reasons for the results below.



Example:

A survey was carried out in an educational centre to find out the most popular form of exercise. The findings showed that the three most popular forms of exercise were walking, gym and weightlifting. Swimming was a close fourth. Students in the centre will greatly benefit from being physically fit, and this will assist them, not only with their learning, but also with their health and overall well-being. Walking is likely to be one of the most popular forms of exercise, as it is considered to be less strenuous, especially for beginners, and it can also be a social activity. The gym is also popular, and weightlifting can be done in the gym. Many people like going to the gym, as it is an environment suited to getting fit, and giving motivation (all those mirrors!) and it is a form of exercise that is not dependent on the weather. The gym also provides the opportunity to take part in different activities, work on different muscles and exercise at one's own pace. Students here in the centre should have access to great walking paths around the centre. There are already paths, but there should be information signs, a clear-up of the paths, a safety check on all the paths, and benches where walkers can rest. A fully-equipped gym will be of great use to the students and will be a great feature for the centre. Having walking paths and a gym will give students the chance to get fit or keep fit, in a safe and convenient environment. These could also be social activities and will give the centre the friendly and helpful atmosphere that we strive to achieve.

(2 marks)



6. Look at the data from Met Eireann. Write some conclusions about the weather in June 2017 in Dublin.



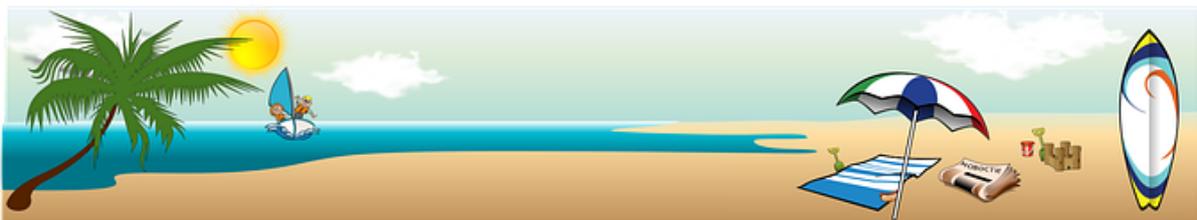
Temperature by Meteorological Weather Station, Statistical indicator and Month

	2017M06
Dublin airport	
Average Maximum Temperature (Degrees C)	18.7
Average Minimum Temperature (Degrees C)	10.7
Mean Temperature (Degrees C)	14.7
Highest Temperature (Degrees C)	26.3
Lowest Temperature (Degrees C)	3.7

Source: Met Eireann

Example:

These are results of temperatures in Dublin in June 2017. The weather was variable. The highest temperature in this month was 26.3°C and the lowest temperature was 3.7°C. There is a big different in these two temperatures! The average maximum temperature was 18.7°C and the average minimum temperature was 10.7°C. The mean temperature was 14.7°C.



(2 marks)



7. The table below shows the number of pets owned by 40 families.

Number of Pets	Frequency
0	13
1	14
2	8
3	3
4	2



Calculate an estimate of the mean number of pets. Give your answer to one decimal place and write what the frequency table means. Also, give possible reasons for the findings.

Example:

1.2 pets is the mean number

The number of people who have 0 pets is 13.

The number of people with 1 pet is 14.

The number of people with 2 pets is 8.

The number of people with 3 pets is 3.

The number of people with 4 pets is 2.

Possible reasons for the findings: There is a quite a high number of people who have no pets. This could be because many people work, and they have no time to take care of pets. Pets need a lot of care, such as feeding, grooming, walking and lots of love! Cost could also be a factor because feeding pets can be expensive, never mind the vet bills and vaccinations. There are also people who do not like pets.

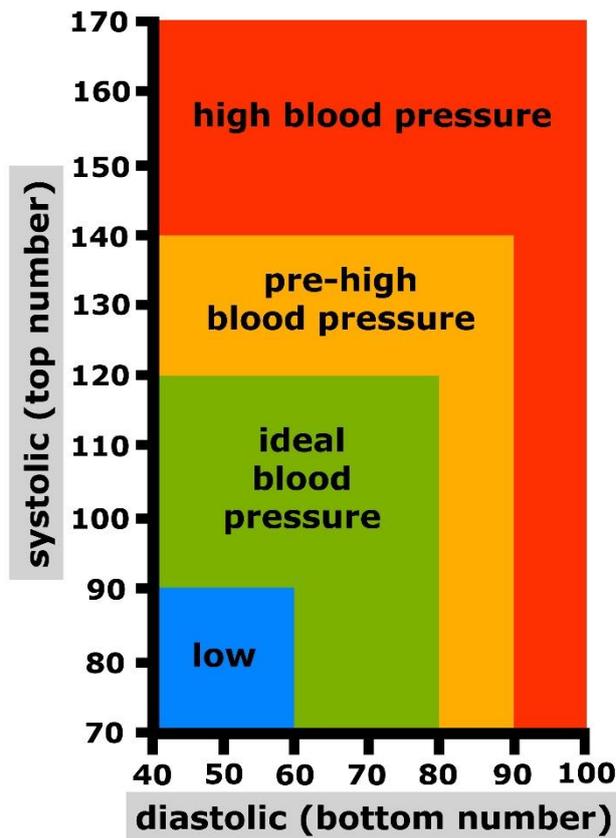
The number of people with one pet is just above those people that have none. For many people, one pet is enough and is more manageable. The higher the number of pets, the less the number of people who have this many, for example, only two people have four pets.

(2 marks)



8. Look at the diagram below. You have been told that your blood pressure is 145/92. Describe the diagram and its different categories. Explain if your blood pressure is healthy or not. If not, suggest possible causes.

BLOOD PRESSURE



Example: High blood pressure would be a systolic over 140 and a diastolic over 90. Pre-high blood pressure would be a systolic over 120 and a diastolic over 80. The ideal blood pressure would be a systolic of between 90 and 120 and a diastolic between 60 and 80. Low blood pressure would be a systolic of 70 to 90 and a diastolic between 40 and 60. My blood pressure of 145/92 falls in the high blood pressure range. Causes of this could be my unhealthy diet and a lack of exercise. I think I will take my doctor's advice!

(2 marks)



9. Carry out some research about something you want to know about.



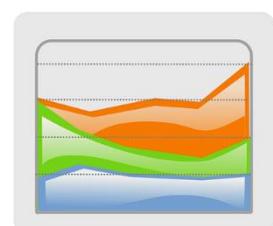
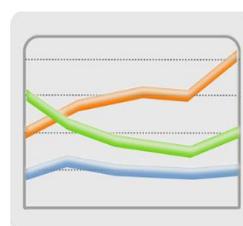
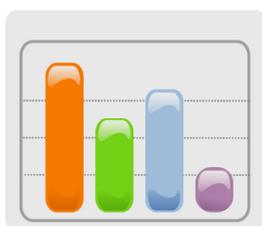
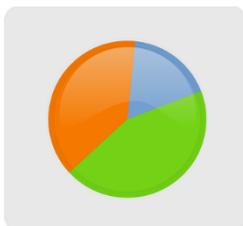
RESEARCH

- Determine your objective, what do you want to find out?
- Design your survey.
- Carry out the research, if applicable, finding reliable sources online and / or in the library. Make notes.
- Carry out a survey, using all the steps as you did before.
- Analyse the data. Describe your findings and possible reasons for the findings.
- Present your findings and the results of your survey, using a method of your choice.

Student's answers

OBJECTIVE	
DESIGN	
RESEARCH (IF APPLICABLE)	
CARRY OUT	
ANALYSE	
PRESENT	

You can use the questions over the page to give you a head start!



(5 marks)



10. You can make rough notes here if you wish:



Student's answers

Include rough notes at the back of your portfolio!

QUESTIONS	ANSWERS /NOTES
Objectives: What do you want your survey to find out?	
Who do you want to respond? Do you have email addresses? Do you have people who can take part in the survey?	
How are you going to distribute your survey? E.g. email, online survey tool, interview, questionnaire, etc.	
What questions are you going to ask?	
What will your sample size be?	
How will you analyse the data? Consider what way you are going to use to make sense of the information you gather i.e. excel, survey monkey, on paper, etc.	
How will you present the findings?	
What is your time frame? Consider the time and help you have when thinking about the tools you are going to use. Factor in piloting the survey i.e. testing the questions out.	



MARKING SHEET Level 4 Mathematics, 4N1987 Assignment 4 – Data Handling			
Student's name:			
	Max mark	Learner's mark	÷ 4
Statistical concepts <ul style="list-style-type: none"> ▪ Types of data (6 marks) <ul style="list-style-type: none"> • Discreet / continuous/ numerical / categorical (2 marks) • Primary and secondary data (2 marks) • Dependent and independent variables (2 marks) ▪ Terms, e.g. population (3 marks) <ul style="list-style-type: none"> • Population (1 mark) • Sample (1 mark) • Sample size (1 mark) ▪ Carrying out a survey (11 marks) <ul style="list-style-type: none"> • Time frame for survey (2 marks) • Collating data (3 marks) • Findings (3 marks) • Presenting results (3 marks) 	20		
Calculating statistics <ul style="list-style-type: none"> ▪ Mean, median and mode (8 marks) ▪ Weighted average (2 marks) ▪ Bar graph (1 mark) ▪ Pie graph (3 marks) ▪ Trend graph (1 mark) ▪ Histogram (2 marks) ▪ Other graphs (3 marks) 	20		
Presenting information from data <ul style="list-style-type: none"> ▪ Trend graph (3 marks) ▪ Bar graph (3 marks) ▪ Pie graph (4 marks) ▪ Frequency table (5 marks) ▪ Cumulative frequency curve (3 marks) ▪ Histogram (2 marks) 	20		
Interpreting results <ul style="list-style-type: none"> ▪ Discussion – statistics (3 marks) ▪ Interpreting a trend graph and pie graph (4 marks) ▪ Interpreting a bar graph (2 marks) ▪ Interpreting weather chart (2 marks) ▪ Interpreting frequency table (2 marks) ▪ Interpreting diagram (2 marks) ▪ Research, collection of data, findings, interpreting data – own project (5 marks) 	20		
Total	80	20	
Comments			