

1 Working with integers

Section 1: Basic calculations

HOMEWORK 1A

Solve these problems using written methods.
 Set out your solutions clearly to show the methods you chose.

- How many 12 litre containers can be completely filled from a tanker containing 783 litres?
- A train is travelling at a constant speed of 64 mph.
 - How far does it travel in $1\frac{1}{2}$ hours?
 - How long does it take to travel 336 miles?



Tip

64 mph means the train travels 64 miles each hour.

- A train starts a journey with 576 people on board. At the first station 23 people get on, 14 get off. At the second station 76 people get off and no one gets on. At the third station a further 45 people get on. How many people are on the train after the third station?
- Henry goes shopping with £125. He spends £26 on a DVD, £38.19 on a jumper and gets three books at £2.85 each. How much does he have left when he returns home?
- If six cups of coffee cost £11.70 and three cups of tea cost £4.23, how much would four cups of coffee and five cups of tea cost?
- Find the difference between the product of 17 and 51 and the sum of 156 and 652.

HOMEWORK 1B

- What do you need to add to each number to make 7?
 a 8 b 13 c -2 d -4 e -24

- What would you subtract from each number to get a result of -12?
 a 8 b 6 c -4 d -9 e -34
- 7 is multiplied by another number to get each result. Work out what the other number is in each case.
 a 14 b -98 c -49 d 343 e -7



Tip

Learn the rules for calculations with negative numbers.

- What would you divide -96 by to get the following results?
 a 8 b -8 c 2 d $-\frac{1}{2}$ e -256
- Here is a set of integers: -7, -5, -1, 2, 7, 11.
 - Find two numbers with a difference of 7
 - Find two numbers with a product of -7
 - Find three numbers with a sum of 4
 - Find two numbers which, when divided will give an answer of -1
- Three less than -5 is subtracted from the product of -4 and 6 less than two. What is the result?
- Two more than -8 is added to the product of 8 and five less than 3. What is the result?

Section 2: Order of operations

HOMEWORK 1C

- Calculate the following:

a $6 \times 11 + 4$	b $6 \times (11 - 2)$
c $5 + 11 \times 2$	d $(3 + 12) \times 4$
e $25 + 6 \times 3$	f $8 \times 3 \div (4 + 2)$
g $(14 + 7) \div 3$	h $43 + 2 \times 8 + 6$
i $24 \div 4 \times (8 - 5)$	j $16 - \frac{8}{2} + 5$

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- 2 Use the numbers listed (in bold) to make each number sentence true.
- a $\square - \square \div \square = \square$ 1, 18, 6, 4
 b $\square - \square \div \square = \square$ 8, 7, 3, 2
 c $\square \div (\square - \square) - \square = \square$ 2, 3, 4, 7, 15
- 3 Insert brackets into each calculation to make it true.
- a $4 \times 5 + 7 = 48$ b $35 - 20 \times 8 = 120$
 c $14 + 6 \div 4 = 5$ d $48 \div 4 \times 3 - 4 = -12$



Tip

Brackets change the order of operations.

- 4 In this question, each \square represents an operation. Fill in the missing operations to make these statements true.
- a $12 \square (36 \square 32) = 3$ b $95 \square (13 \square 8) = 19$
- 5 Work out without using a calculator:
- a $10 \times \frac{\sqrt{25}}{3^2 + 4^2}$ b $6^{2 \times} \frac{\sqrt{4}}{2^2 \times 3^2}$
 c $\frac{\sqrt{4} + 5^5}{3^2 \times \sqrt{81}}$ d $\frac{6^2 + 8^2}{12^2 - (4^2 \times \sqrt{9}) + 2^2}$

Section 3: Inverse operations

HOMEWORK 1D

- 1 Find the additive inverse of each of these numbers.
 a 7 b 6 c 200 d -7 e -21 f -36
- 2 By what number would you multiply each of these to get an answer of 1?
 a 4 b 12 c -5 d $\frac{1}{2}$ e 7 f $\frac{1}{8}$
- 3 Use inverse operations to check the results of each calculation.
 Correct those that are incorrect.
 a $50 \times 5 - 8 = 227$ b $16 + 5 \times 8 - 12 = 50$
 c $(28 + 53) \times 4 = 264$ d $(432 - 148) \div 4 = 71$



Tip

The inverse is the 'opposite' operation that reverses the effect of an operation.

- 4 Use inverse operations to find the missing values in each of these calculations.
- a $\square + 564 = 729$ b $\square + 389 = 786$
 c $\square - 293 = 146$ d $132 \times \square = -3564$
 e $-8 \times \square = 392$ f $\square \div 30 = 4800$
- 5 The formula for finding the area of a triangle is $A = \frac{bh}{2}$.

Find the height of a triangle if it has an area of 72 cm^2 and a base length of 8 cm .

CHAPTER 1 REVIEW

- 1 Bonita and Kim travel for three and a half hours at $48 \text{ kilometres per hour}$. They then travel a further 53 km . What is the total distance they have travelled?
- 2 On a page of a newspaper there are eight columns of text. Each row contains a maximum of 38 characters (spaces between words count as characters). Each column has a total of 168 rows .
- a What is the maximum number of characters that can appear on a page?
 b The average word length is six characters, and each word needs a space after it. Estimate the number of words that can fit on a page.
- 3 A theatre has seats for 2925 people . How many rows of 75 is this?
- 4 Two numbers have a sum of -12 and a product of -28 . What are the numbers?
- 5 Jadheja's bank account was overdrawn. She deposited $\text{£}750$ and this brought her balance to $\text{£}486$. By how much was her account overdrawn to start with?
- 6 We use the approximate formula $F = 2C + 32$ to convert temperatures from Celsius to Fahrenheit. Without using a calculator, find the temperature in degrees Celsius when it is:
 a 78°F b 120°F

2 Collecting, interpreting and representing data

Section 1: Populations and samples

HOMEWORK 2A

- 1 A local shop owner wants to find out how many boxes of a new crisp flavour she should order. She asks the first ten customers who come into the shop whether they would buy the new flavour if she started selling them.
 - a What is the population in this survey?
 - b What is the sample involved in the survey?
 - c Is this a representative sample or not? Give a reason for your answer.
- 2 Sami says: 'More and more people are using texts these days instead of phoning and talking to each other.' How could you collect data to find out whether this statement is true or not? Include details about the sources of your data and the sample size.
- 3 The statements below show you what four students found out when they collected data.

Student A 30% of heart disease is caused by smoking.

Student B 79% of all dustbin content is recyclable.

Student C Most people spend between £5 and £10 per day on transport.

Student D Almost $\frac{2}{3}$ of the women at my mum's workplace say that men earn more than they do.

 - a What question do you think each student was trying to answer?
 - b What sources of information do you think each student used to find their data?
 - c How do you think student D selected a random sample from her mum's workplace?

Section 2: Tables and charts

HOMEWORK 2B

- 1 Nika tossed a dice 40 times and got these results.

6	6	6	5	4	3	2	6	5	4
1	1	3	2	5	4	3	3	3	2
1	6	5	5	4	4	3	2	5	4
6	3	2	4	2	1	2	2	1	5

- a Copy and complete this frequency table to organise the data.

Score	1	2	3	4	5	6
Frequency						

- b Do the results suggest that this is a fair dice or not? Give a reason for your answer.
- 2 The table shows the population (in millions) of five of the world's largest cities.

City	Tokyo	Seoul	Mexico City	New York	Mumbai
Population (millions)	32.5	20.6	20.5	19.75	19.2

Draw a bar chart to show this data.

- 3 The frequency table shows the number of people who were treated for road accident injuries in the A & E ward of a large hospital in the first six months of the year. Draw a vertical line graph to represent the data. Use a scale of 1 cm per 50 patients on the vertical axis.

Month	Number of patients
January	360
February	275
March	190
April	375
May	200
June	210

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4 Draw a vertical line to show this data.

Favourite takeaway food	Burgers	Kebabs	Fried chicken	Chips	Other
No. of people	40	30	84	20	29

HOMEWORK 2C

1 The table below shows the type of food that a group of students on a camping trip chose for breakfast.

	Cereal	Hot porridge	Bread
Girls	8	16	12
Boys	2	12	10

- a Draw a single bar chart to show the choice of cereal against bread.
- b Draw a compound bar chart to show the breakfast food choice for girls and boys.

2 The favourite subjects of a group of students are shown in the table.

Subject	Girls	Boys
Mathematics	34	33
English	45	40
Biology	29	31
ICT	40	48

- a Draw a double bar graph to show this data.
- b How many girls chose Mathematics?
- c How many boys chose ICT?
- d Which is the favourite subject among the girls?
- e Which subject was chosen as favourite by the fewest boys?

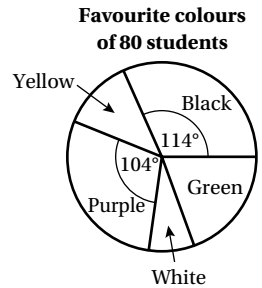
3 A tourist organisation in the Caribbean records how many tourists visit their region each month from the UK and from other countries. Draw a compound bar graph to display the data for the first six months of the year.

	UK visitors	Other visitors
Jan.	12 000	40 000
Feb.	10 000	39 000
Mar.	19 000	15 000
Apr.	16 000	12 000
May	21 000	19 000
Jun.	2000	25 000

Section 3: Pie charts

HOMEWORK 2D

1 This pie chart shows the colours that 80 students selected as their favourite from a five-colour chart.



- a Which colour is most popular?
- b Which colour is least popular?
- c What percentage of the students chose purple as their favourite colour?
- d How many students chose black as their favourite colour?

2 This table shows the approximate percentage of the world's population living on each continent.

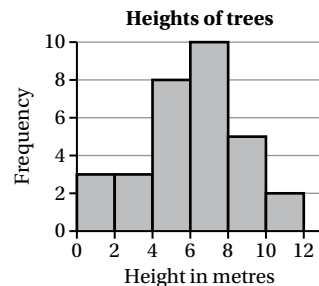
Africa	Asia	Europe	North America	South America	Oceania
13	61	12	5	8.5	0.5

- a Draw a pie chart to display this data.
- b How else could you display this data?

Section 4: Cumulative frequency graphs and histograms

HOMEWORK 2E

1 This partially completed histogram shows the heights of trees in a section of tropical forest.



- a A scientist measured five more trees and their heights were: 2.09 m, 3.34 m, 6.45 m, 9.26 m and 3.88 m. Redraw the graph to include this data.
- b Taking into account these five extra trees, how many trees in this sector of forest are ≥ 6 m tall?
- c What is the modal class of tree heights?

2 Collecting, interpreting and representing data

2 A nurse measured the masses of a sample of students in a high school. Her results are below.

Mass (kg)	Frequency
$54 \leq \text{kg} < 56$	4
$56 \leq \text{kg} < 58$	7
$58 \leq \text{kg} < 60$	13
$60 \leq \text{kg} < 62$	19
$62 \leq \text{kg} < 64$	11

- Draw a histogram to show the distribution of masses.
- What is the modal class interval?
- What percentage of students weighed less than 56 kg?
- What is the maximum possible range of the masses?

3 The table below shows the average number of minutes of phone credit that teenagers bought during one week.

Minutes (m)	Number of teenagers
$20 \leq m < 30$	10
$30 \leq m < 40$	15
$40 \leq m < 60$	40
$60 \leq m < 80$	50
$80 \leq m < 100$	60
$100 \leq m < 150$	50

Draw an accurate histogram to display this data. Use a scale of 1 cm to represent ten minutes on the horizontal axis and an area scale of 1 cm^2 per five persons.

4 Thirty seedlings were planted for a biology experiment. The heights of the plants were measured after three weeks and recorded as shown below.

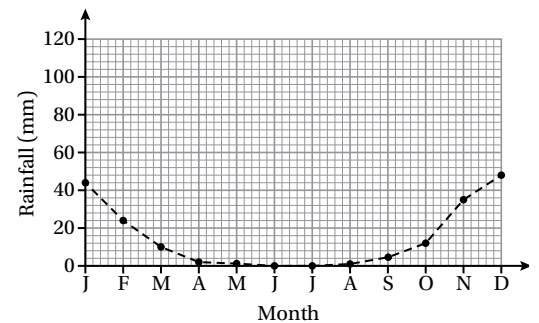
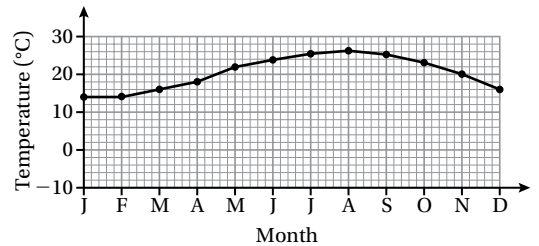
Heights (h) (centimetres)	Frequency
$0 \leq h < 3$	3
$3 \leq h < 6$	8
$6 \leq h < 9$	15
$9 \leq h < 12$	4

- Find an estimate for the mean height.
- Draw a cumulative frequency curve and use it to find the median height.
- Estimate Q1 and Q3 and the IQR.

Section 5: Line graphs for time-series data

HOMEWORK 2F

1 The graphs below represent the average monthly temperature and the average monthly rainfall for Cairo, in Egypt.



- What is the maximum average temperature?
- In what months is the average temperature above 20°C ?
- Is Egypt in the northern or southern hemisphere?
- Is the temperature ever below freezing point?
- What is the average rainfall in November?
- In which month is the average rainfall 2 mm?
- Looking at both graphs, what can you say about the rainfall when the temperatures are high?

2 Amy bought a new car in 2010. Its value over time is shown below.

Year	Value of car
2010	£13 900
2011	£7 000
2012	£5 700
2013	£4 700
2014	£4 000

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- a Draw a line graph to represent this information.
- b What is the percentage depreciation in the first year she owned the car?
- c Use your graph to estimate the value of the car in 2015.

CHAPTER 2 REVIEW

1 Michelle collected data about how many children different families in her community had. Her results are shown below.

0	3	4	3	3	2	2	2	2	1	1	1
3	3	4	3	6	2	2	2	0	0	2	1
5	4	3	2	4	3	3	3	2	1	1	0
3	1	1	1	1	0	0	0	2	4	5	3

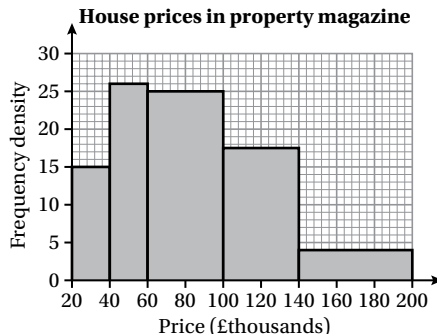
- a How do you think Michelle collected the data?
- b Draw up a frequency table, with tallies, to organise the data.
- c Represent the data on a pie chart.
- d Draw a bar chart to compare the number of families that have three or fewer children with those that have four or more children.

2 Sally did a survey to find the ages of people using an internet cafe. Her results are shown below.

Age (<i>a</i>)	Number of people
$15 \leq a < 20$	14
$20 \leq a < 25$	12
$25 \leq a < 35$	12
$35 \leq a < 50$	12
$50 \leq a < 55$	8

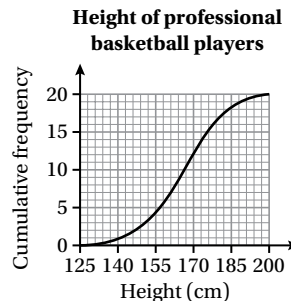
Draw an accurate histogram to show these data. Use a scale of 1 cm to represent five years on the horizontal axis and an area scale of one square centimetre to represent two people.

3 The histogram below shows the number of houses in different price ranges which were published in a property magazine.



- a How many houses were in the £20 000 to £40 000 price range?
- b How many houses were in the £140 000 to £200 000 price range?
- c How many houses are represented by one square centimetre on this graph?

4 This cumulative frequency curve shows the height in centimetres of 200 professional basketball players.



- a Estimate the median height of players in this sample.
- b Estimate Q1 and Q3.
- c Estimate the IQR.
- d What percentage of the basketball players are over 1.82 m tall?

5 A cosmetics company publishes an advertisement for an anti-ageing cream which makes the following claims:

Visible results clinically proven in 28 days

- Reduces forehead wrinkles by 30%
- Reduces crows' feet wrinkles by 23%
- Reduces under-eye wrinkles by 18%

- a What do these claims suggest about the product?
- b How do you think this data was collected?
- c At the bottom of the advertisement there is small print that says: 'Clinical test score on 38 women over a 28 day period'. Comment on the sample used to collect this data.

3 Analysing data

Section 1: Summary statistics

HOMEWORK 3A

1 For each of the frequency distributions (data sets A–C) shown below calculate:

- a the mean score
- b the median score
- c the modal score.

Data set A

Score	1	2	3	4	5	6
Frequency	12	14	15	12	15	12

Data set B

Score	10	20	30	40	50	60	70	80
Frequency	13	25	22	31	16	23	27	19

Data set C

Score	1.5	2.5	3.5	4.5	5.5	6.5
Frequency	15	12	15	12	10	21

2 The table shows the number of words per minutes typed by a group of computer programmers.

Words per minute (w)	frequency
$31 \leq w < 36$	40
$36 \leq w < 41$	70
$41 \leq w < 46$	80
$46 \leq w < 51$	90
$51 \leq w < 56$	60
$56 \leq w < 61$	20

- a Calculate an estimate for the mean number of words typed per minute.
- b What is the modal number of words typed per minute?
- c What is the median class?

3 For each of the following data sets calculate the median, upper and lower quartiles. In each case calculate the interquartile range.

Data set A	67, 44, 63, 56, 46, 48, 55, 63
Data set B	17, 18, 17, 14, 8, 3, 15, 18, 3, 15
Data set C	0.8, 1.3, 0.7, 1.4, 2.3, 0.4
Data set D	1, 0, 2, 2, 0, 4, 1, 3, 1, 2, 3, 4, 5, 4, 5, 5

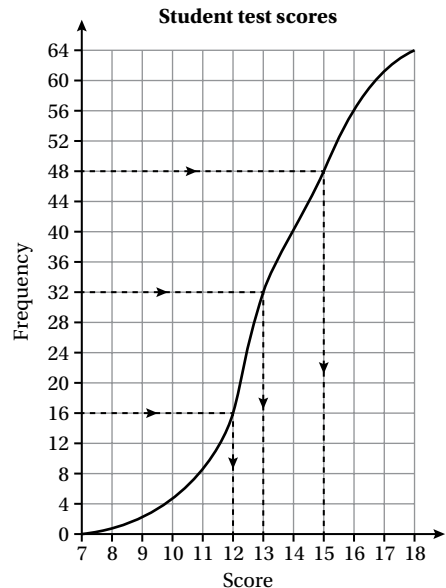
4 20 pupils take a French test and their scores out of 100 are recorded in the table below.

34	76	92	89
21	23	45	87
65	96	23	38
72	91	32	77
98	80	81	20

- a Find the median score for the pupils.
- b Calculate the interquartile range for the pupils' scores.

HOMEWORK 3B

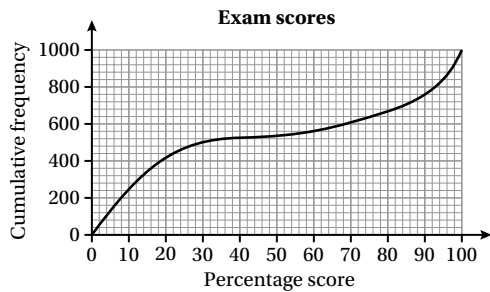
1 Use the cumulative frequency curve shown below to find the missing values in each sentence.



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- a $__$ students scored below 15. $__$ marks is the upper quartile.
- b 32 students scored below $__$. $__$ marks is the median or Q_2 mark.
- c 16 students scored below $__$. $__$ marks is the first quartile or Q_1 .
- d The IQR is $__$.

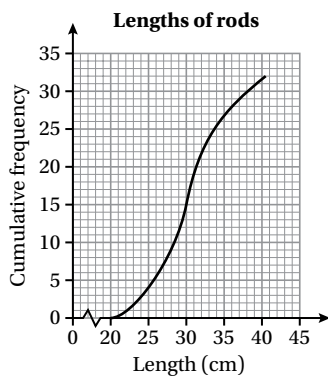
- 2 The percentage scored by 1000 students on an exam is shown on the cumulative frequency curve shown below.



Use the curve to find an estimate for:

- a the median score
- b the lower quartile
- c the upper quartile
- d the interquartile range.

- 3 The lengths of 32 metal rods were measured and recorded in the cumulative frequency curve shown below.



Use the graph to find an estimate for:

- a the median
- b Q_1
- c Q_3
- d the IQR.

HOMEWORK 3C

- 1 Five students scored a mean mark of 14.8 out of 20 for a maths test.
- a Which of these sets of marks fit this mean?
 - i 14, 16, 17, 15, 17
 - ii 12, 13, 12, 19, 19
 - iii 12, 19, 12, 18, 13
 - iv 13, 17, 15, 16, 17
 - v 19, 19, 12, 0, 19
 - vi 15, 15, 15, 15, 14
 - b Compare the sets of numbers in your answer above. Give a reason why you can get the same mean from different sets of numbers.

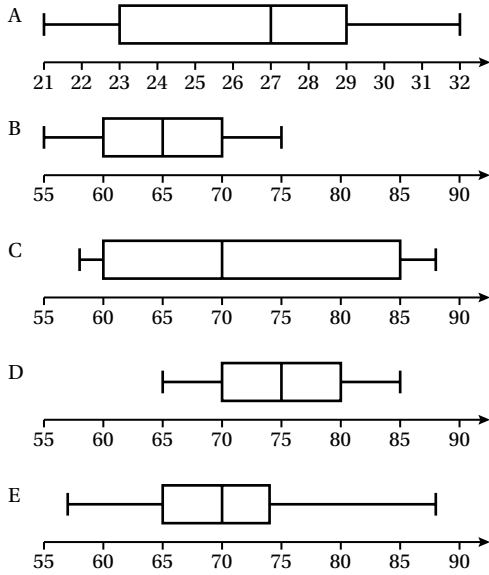
- 2 Twenty students scored the following results in a test out of 20.
- 17 18 17 14 8 3 15 18 3 15
 0 17 16 17 14 7 18 19 5 15
- a Calculate the mean, median, mode and range of the marks.
 - b Why is the median the best summary statistic for this particular set of data?

- 3 The table below shows the times in minutes and seconds that two runners achieved over 800 m during one season.

Runner A	2 min 2.5 s	2 min 1.7 s	2 min 2.2 s	2 min 3.7 s	2 min 1.7 s	2 min 2.9 s	2 min 2.6 s
Runner B	2 min 2.4 s	2 min 1.8 s	2 min 2.3 s	2 min 4.4 s	2 min 0.6 s	2 min 2.2 s	2 min 1.2 s

- a Which runner is the better of the two? Why?
 - b Which runner is more consistent? Why?
- 4 Two students get the following results for six mathematical tests which are marked out of 100.
- Anna: 60, 90, 100, 90, 90, 100
 Zane: 60, 70, 60, 70, 70, 100
- a What is the range of scores for each student?
 - b Does this show they both had equally good results?
 - c Which statistic would be a better measure of their achievement? Why?

5 Examine the box plots shown below.



For each plot, identify the:

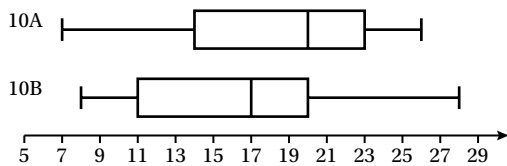
- a median b range c upper quartile
 d lower quartile e IQR.

6 The weekly growth of 13 plants is given to the nearest millimetre below.

12	13	5	8	9	24	16	14	14	6	9	12	12
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- a Draw a box plot to represent this information.
 b What is the IQR of this data set?

7 The box plots shown below display the test results (marked out of 30) for two year 10 classes.

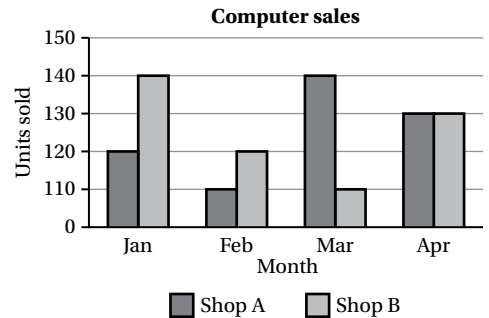


- a Summarise the data for each class.
 b What do these results tell you about the performance of the two classes?

Section 2: Misleading graphs

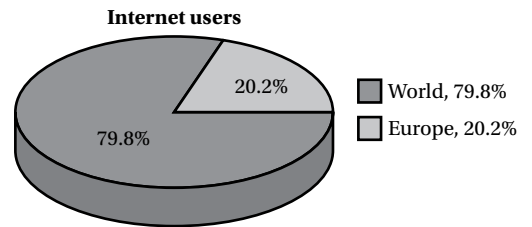
HOMEWORK 3D

1 This graph shows the number of computers sold by two competing stores over a four month period.



- a Did shop B sell double the number of computers that shop A sold in January? Give a reason for your answer.
 b Did shop A sell four times as many computers as shop B in March? Give a reason for your answer.
 c Calculate the total number of computers sold over the period for each shop. How do the figures compare?
 d How is this graph misleading?

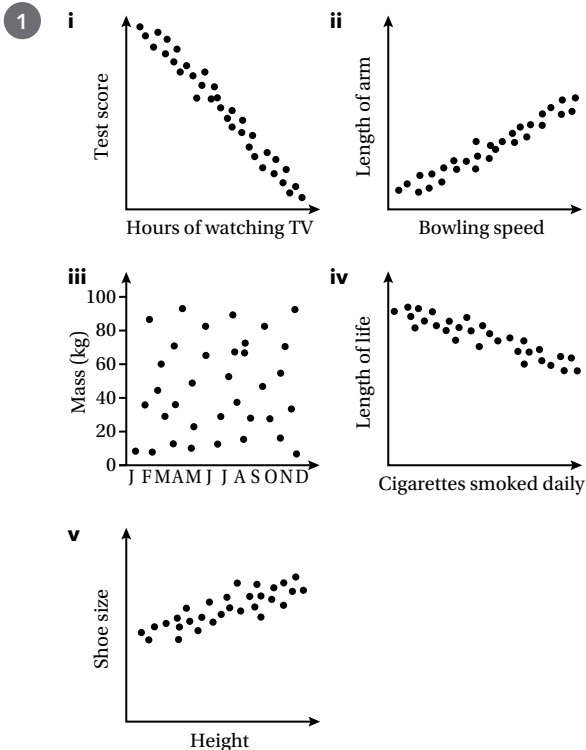
2 Study the pie chart below.



- a What does the chart suggest to you? Why?
 b Europe has 11.5% of the world's population. Does this affect how you interpret this graph? Give a reason for your answer.
 c Why should pie charts not be shown with 3D sections?

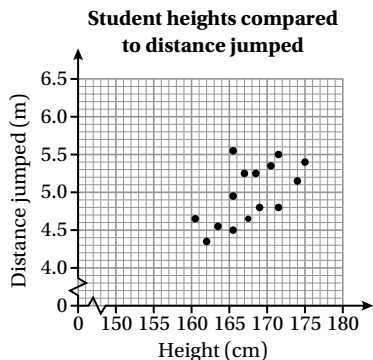
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Section 3: Scatter diagrams
HOMEWORK 3E



- a Describe the correlations shown on the scatter diagrams shown above.
- b Copy graphs i, ii, iv and v and draw a line of best fit on them.

- 2 Sookie collected data from 15 students in her school athletics team. She wanted to see if there was a correlation between the height of the students and the distance they could jump in the long-jump event. She drew a scatter diagram to show the data as shown below.



- a Copy the diagram and draw the line of best fit onto it.

- b Use your line of best fit to estimate how far a student 165 cm tall could jump.
- c For the age group of Sookie's school team, the girls' record for long jump is 6.07 m. How tall would you expect a girl to be who could equal the record jump?
- d Describe the correlation shown on the graph.
- e What does the correlation indicate about the relationship between height and how far you can jump in the long-jump event?

- 3 Mrs Andrews wants to know whether her students' results on a mid-year test are a good indication of how well they will do in the GCSE examinations. The results from the test and the examination are given for a group of students.

Student	Mid-year mark	GCSE mark	Student	Mid-year mark	GCSE mark
Anna	78	73	Tina	92	86
Nick	57	51	Yemi	41	50
Sarah	30	39	Asma	75	64
Ahmed	74	80	Rita	84	77
Sanjita	74	74	Mike	55	58
Moeneeb	88	73	Karen	90	80
Kwezi	94	88	James	89	87
Pete	83	69	Priya	95	96
Idowu	70	63	Claudia	67	70
Sam	61	67	Noel	45	50
Emma	64	68	Wilma	70	64
Gibrine	49	54	Teshi	29	34

- a Draw a scatter diagram with the GCSE results on the vertical axis.
- b Comment on the strength of the correlation.
- c Draw the line of best fit for this data.
- d Estimate the GCSE results of a student who got 65 in the mid-year test.
- e Comment on the likely accuracy of your estimate in part d.

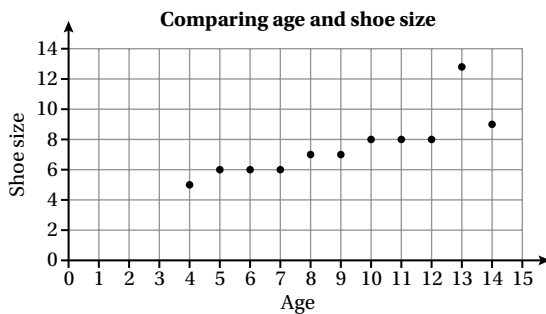
- 4 Lyra read the following in the newspaper:
The New England Journal of Medicine reports that the number of Nobel prizes won by a country (adjusting for population) correlates well with per capita chocolate consumption.

Does this mean that eating chocolate may cause more people to win Nobel prizes? Explain your answer.

HOMWORK 3F

- 1 For the following data sets (A–C), one of the three averages is not representative. In each case state which average does not represent the data well and give a reason for your answer.
 Data set A 6, 2, 5, 1, 5, 7, 2, 3, 8
 Data set B 2, 0, 1, 3, 1, 6, 2, 9, 10, 3, 2, 2, 0
 Data set C 21, 29, 30, 14, 5, 16, 3, 24, 17

- 2 A scatter plot of the age and shoe size of 11 boys is shown below.



- a Comment on the correlation.
 b Identify any outliers.
- 3 Silvie works as a waitress. She records her tips for the last eight shifts as shown below.
 £10 £20 £10 £15 £30 £25 £10 £200
- a Find the mean amount she is tipped.
 b What is the range of tips?
 c What is the median amount she received in tips?
 d What is the median without the outlier?
 e What is the mean without the outlier?

CHAPTER 3 REVIEW

- 1 The mean of two consecutive numbers is 9.5
 The mean of eight different numbers is 4.7
- a Calculate the total of the first two numbers.
 b What are these two numbers?
 c Calculate the mean of the ten numbers together.
- 2 Three suppliers sell specialised remote controllers for access systems. A sample of 100 remote controllers is taken from each supplier and the working life of each controller is measured in weeks. The following table shows the mean time and range for each supplier.

Supplier	Mean (weeks)	Range (weeks)
A	137	16
B	145	39
C	141	16

Which supplier would you recommend to someone who is looking to buy a remote controller? Why?

- 3 A box contains 50 plastic blocks of different volume as shown in the frequency table.

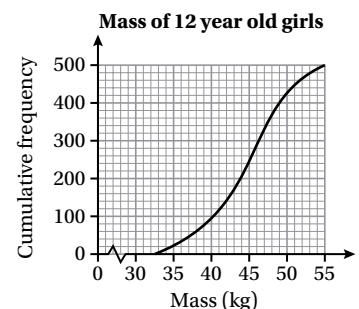
Volume (cm ³)	2	3	4	5	6	7
Frequency	4	7	9	12	10	8

- a Find the mean volume of the blocks.
 b What volume is most common?
 c What is the median volume?
- 4 The ages of people who visited an art exhibition are recorded and organised in the grouped frequency table below.

Age in years (<i>a</i>)	Frequency
$0 \leq a < 10$	13
$10 \leq a < 20$	28
$20 \leq a < 30$	39
$30 \leq a < 40$	46
$40 \leq a < 50$	48
$50 \leq a < 60$	31
$60 \leq a < 70$	19
Total	

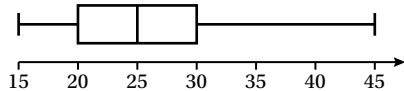
- a Estimate the mean age of people attending the exhibition.
 b What is the modal age group?
 c What is the median age of visitors to the exhibition?
 d Why can you not calculate an exact mean for this data set?

- 5 The cumulative frequency curve shown displays the mass (in kilograms) of 500 12-year-old girls.



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- a Estimate the quartiles for the data set.
 b What is the median mass?
 c Calculate the IQR for the data set.
- 6 The box plot below shows the average distance commuters in Leeds travel to get to work each day.



- a What is the median distance travelled?
 b What is the maximum distance travelled?
 c What percentage of commuters travel 30 km or less?
 d What percentage of the commuters travel between 15 and 25 km?
 e What is the IQR?
 f What is the range of distances travelled?

4 Properties of integers

Section 1: Review of number properties

HOMEWORK 4A

- 1 Write down the factors of the following numbers:
 a 24 b 36 c 81 d 53
- 2 Look at the numbers below.
- | | | | | | | | | | | | | | | |
|---|----|---|----|---|----|----|---|---|----|----|----|----|---|---|
| 4 | 15 | 8 | 25 | 7 | 16 | 12 | 9 | 6 | 23 | 36 | 96 | 27 | 3 | 1 |
|---|----|---|----|---|----|----|---|---|----|----|----|----|---|---|
- Choose and write down the numbers in the list that are:
- a odd b even c prime
 d square e cube f factors of 12
 g multiples of 4
 h common factors of 24 and 36
 i common multiples of 3 and 4.



Tip

Check you know the words for different types of number.

- 3 Write down:
- a the next four odd numbers after 313
 b the first four consecutive even numbers after 596
 c the square numbers between 40 and 100 inclusive
 d the factors of 43
 e four prime numbers between 30 and 50

- f the first five cube numbers
 g the first five multiples of 7
 h the factors of 48.

- 4 Say whether the results will be odd or even or could be either.
- a The product of two odd numbers.
 b The sum of two odd numbers.
 c The difference between two odd numbers.
 d The square of an even number.
 e The product of an odd and an even number.
 f The cube of an even number.

HOMEWORK 4B

- 1 Write these sets of numbers in order from smallest to biggest:
- a 425 542 145 527 457 524
 b 707 770 777 708 807 780
 c 789 8798 987 889 8189 9917
 d 45 120 45 210 45 102 45 100
 e 245 54 -245 -254 -2004 205
- 2 Write down the value of the 6 in each of these numbers:
- a 126 b 63 c 601
 d 1063 e 64 321 f 26 457
 g 1 645 245 h 6 145 458
- 3 What is the value of 8 in the number 128 459? Choose from the following:
- a 800 b 8000
 c 8 d 80 000

Section 2: Prime factors

HOMEWORK 4C

- Identify the prime numbers in each set.
 - 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.
 - 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110
- Express the following numbers as a product of their prime factors. Use the method you prefer. Write your final answers using powers.

a 48	b 75	c 81	d 315
e 560	f 2310	g 735	h 1430
i 32	j 625	k 864	



Tip

Remember each number has a unique set of prime factors.

- A number is expressed as $13 \times 23 \times 7$. What is the number?
- What are the factors of 7120?
 - What are the factors of 2279?
 - What do you notice about the factors of 2279?
 - Did it take longer to find the factors of 2279 or 7120?
- Calculate 31×67
 - What are the factors of 2077?

Section 3: Multiples and factors

HOMEWORK 4D

- Find the LCM of the numbers below.

a 12 and 16	b 15 and 20	c 12 and 20
d 24 and 30	e 3, 4 and 6	f 5, 7 and 10
- Find the HCF of the numbers below.

a 18 and 24	b 36 and 48	c 27 and 45
d 14 and 35	e 21 and 49	f 36 and 72

- Find the LCM and the HCF of the following numbers by means of prime factors.

a 28 and 98	b 75 and 20	c 144 and 24
d 54 and 12	e 214 and 78	
- Ade, Kane and Wolfram are long-distance runners. They all train on the same track. It takes Ade 60 seconds to complete a lap, Kane 75 seconds and Wolfram 50 seconds. They start at the same place at the same time. Assume that they can continue at this pace. How long will it be before they all cross the line together?
- Mr Singh wants to tile a rectangular patio with dimensions $5.4 \text{ m} \times 9.6 \text{ m}$ with a whole number of identical square tiles. Mrs Singh wants the tiles to be as large as possible.
 - What is the largest possible square tile that will fit exactly along both dimensions? Show your working.
 - Find the area of the largest possible tile in cm^2 . Show your working.
 - How many tiles will Mr Singh need to tile the patio? Show your working.

CHAPTER 4 REVIEW

- Is 243 a prime number? Write down how you worked out your answer.
- Find the HCF and the LCM of 18 and 45 by listing the factors and multiples.
- Express 675 as a product of prime factors, giving your final answer in power notation.
- Find the HCF and the LCM of the following by prime factorisation.

a 64 and 104	b 54 and 80
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- Nick starts his training for a triathlon on Monday 2 May. He swims and cycles on this day. He decides to swim every third day, run on Wednesdays and Saturdays and cycle every fourth day. On which date in May will he swim, run and cycle on the same day?