

# Accelerating Progress: mathematics

Learner workbook



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# Introduction

## Course aims

Accelerating Progress courses aim to:

- develop the essential subject-specific skills required to gain a good pass in GCSE examinations
- provide opportunities to practise these skills in contextual situations
- boost your grades and confidence in the subject

### Modules

The Accelerating Progress: mathematics course contains challenges across five modules. These modules reflect the key aspects of the GCSE specification.

- Data handling and statistics
- Money-related number problems
- Essential number skills
- Shape, space and measure
- Algebraic skills

### Sections

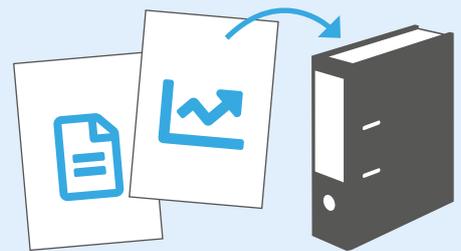
Each module is split into two sections – Section A and Section B:

- Section A comprises shorter challenges that develop the skills, knowledge and understanding required for the module topic
- Section B comprises extended challenges to stretch your independent thinking skills and further develop the learning from the section A challenges

## What do I need to do?

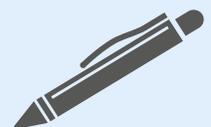
### 1 Carry out your chosen challenges

- **For section A challenges:** complete the worksheets provided
- **For section B challenges:** file your evidence in your portfolio



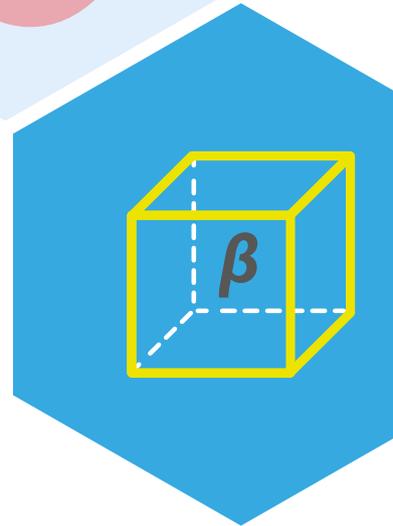
### 2 Fill in your completed challenge on the record of progress

Use the record of progress (page 5) to keep a careful record of the challenges you have completed and the credits you have gained.



### 3 At the end of your course, your tutor will check your work

Your tutor will complete the tutor record on page 5. If you have met the requirements, your tutor will request your certificate from ASDAN.



# Module 1

Data handling  
and statistics



# Development challenges

## Section A: Complete ALL challenges over 10 hours for 1 credit



### For each challenge

- Complete the **worksheets** provided on pages 10–27 of this book
- Use the **evidence ref** box to highlight where any additional evidence can be found in your portfolio
- Ask your tutor to complete the **verified by**, **date** and **tutor feedback** sections



### Challenge 1A1



Keep a record of how you use your time every day for **one** week. Make charts to show the percentage of time you spend on each type of activity.

Compare your charts with other people's and write **five** statements that compare how much time you spend on different activities.

Evidence ref
Verified by
Date

Tutor feedback

### Challenge 1A2



Find data about the weather each day for **one** month in **three** holiday destinations and in your home area. Collect data for at least three measures (eg rainfall, sunshine, minimum temperature). Compare your results and add other measures if you wish.

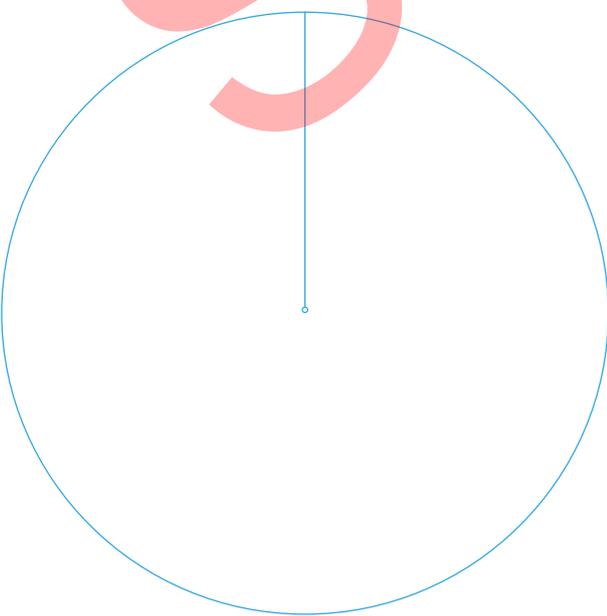
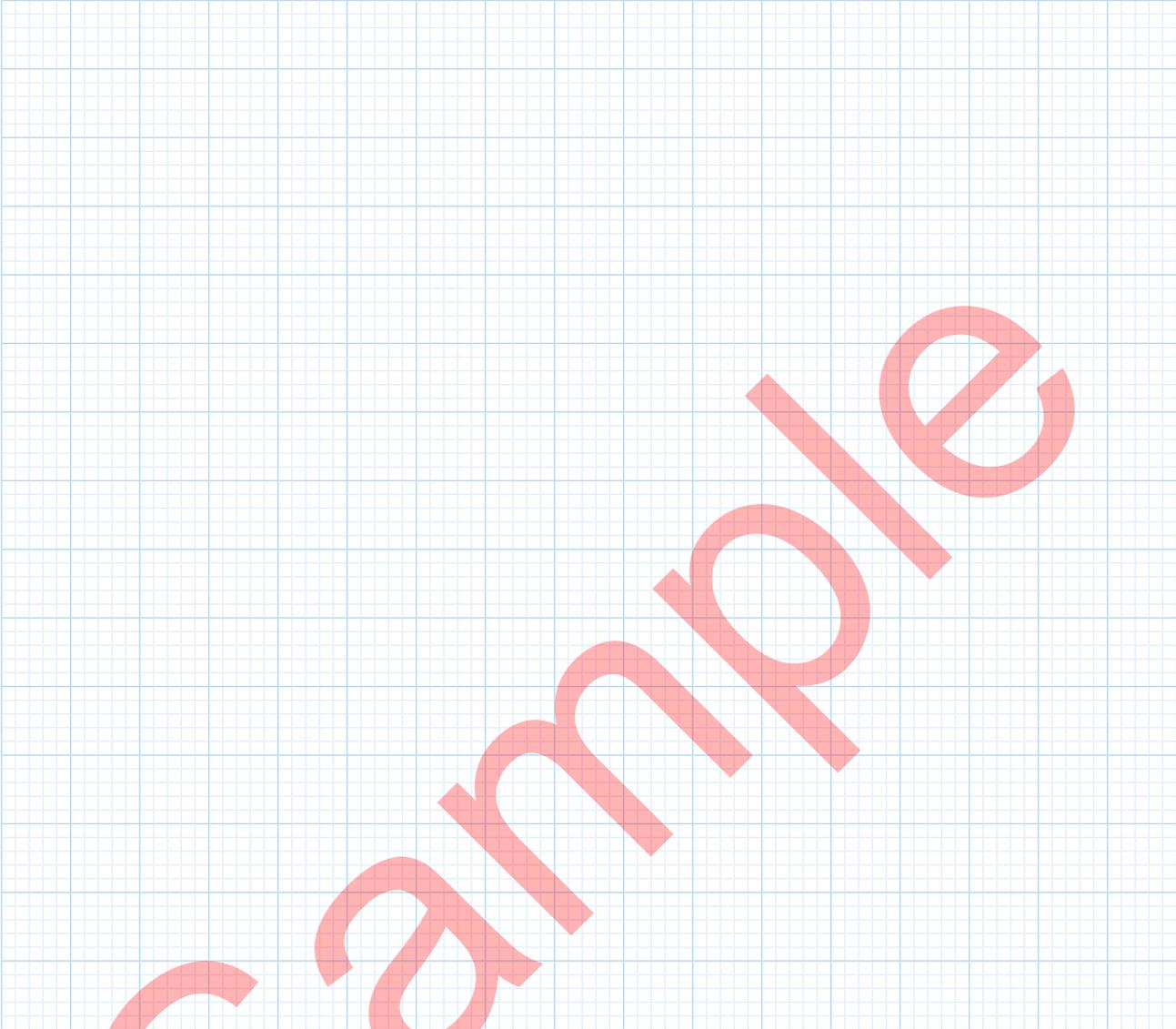
State where you would most like to be that month and give reasons for your choice.

Evidence ref
Verified by
Date

Tutor feedback



# Weekly bar chart and pie chart



Key

Module 2: Money-related number problems



# Comparing mobile phone deals

Work out the cost of each option over the duration of the contract.

- First month cost = upfront cost + (monthly cost × month)
- Subsequently month cost = monthly cost × month

Cost £				
Month	Option 1	Option 2	Option 3	Option 4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
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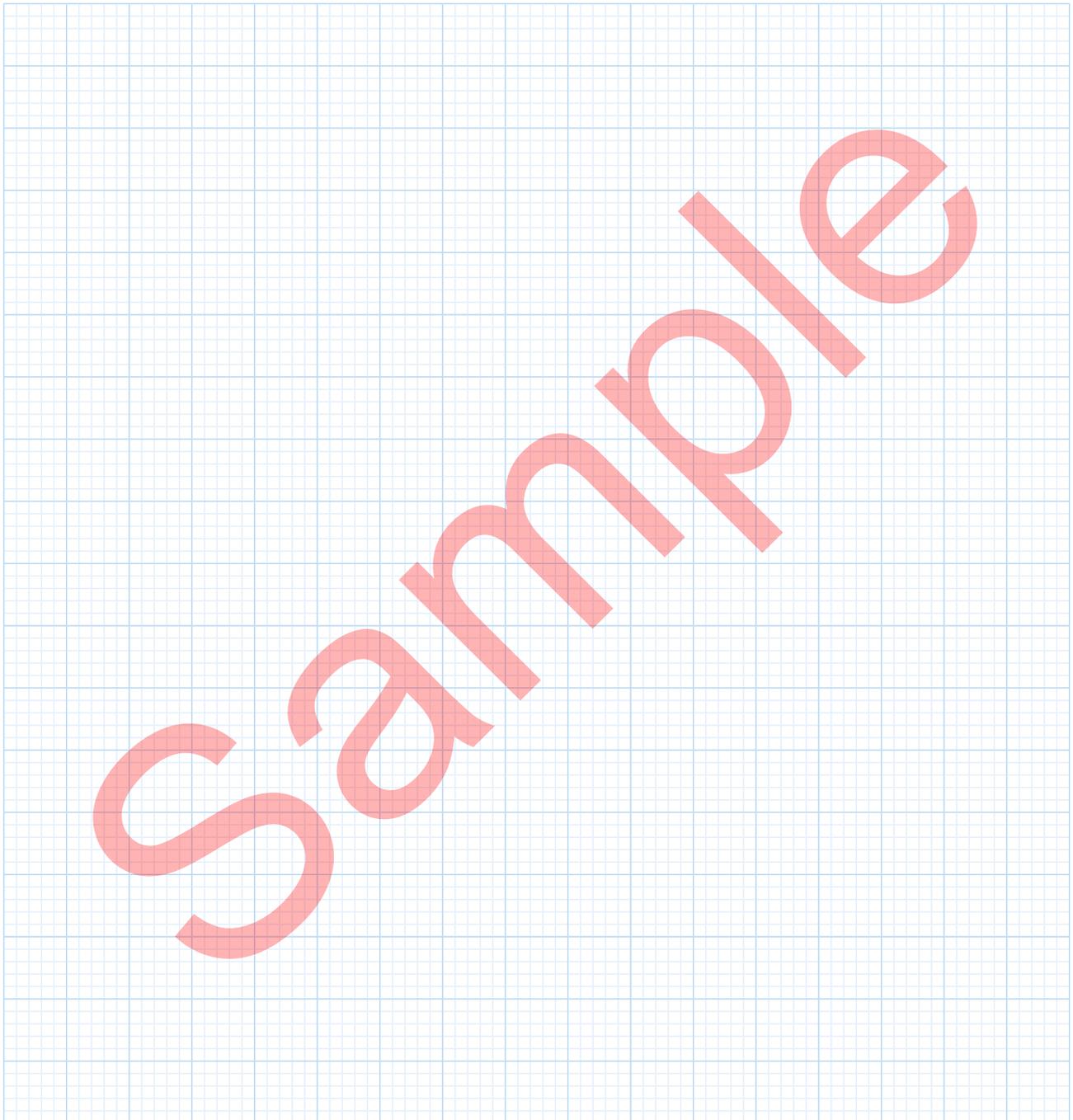
Sample



# Comparing mobile phone deals

Plot a line graph showing the cost of each option over time.

- The title of your graph should be 'Comparison of mobile phone deals'
- Put the price in £ on the y axis (from £0 to the total cost) and put the month on the x axis
- Use even spacing and a different colour for each option



<p>Which is the best deal?</p>	<hr/> <hr/>
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# Extended challenges

## Section B: Complete ONE challenge over 10 hours for 1 credit



### Challenge 3B1



Investigate which fractions give recurring decimals. Identify which fractions have different numbers of digits recurring (eg one digit recurring, two digits recurring, three digits recurring). Find out what the denominators of fractions that do not recur have in common.

Evidence ref

Verified by

Date

Tutor feedback

### Challenge 3B2



Draw graphs to convert litres to gallons and kilometres to miles.  
Find actual fuel consumptions of **at least three** vehicles in miles per gallon, then convert to kilometres per litre.  
Plan a journey and work out how far it is in kilometres.  
Calculate the cost of fuel for your trip in the different vehicles.

Evidence ref

Verified by

Date

Tutor feedback



# Development challenges

## Challenge 5A3

Use linear graphs to calculate when a company starts to make a profit. This is called a break-even analysis. You will need to produce formulae and graphs.

Evidence ref
Verified by
Date

Tutor feedback

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## Challenge 5A4

Investigate straight line graphs. Plot a series of graphs and then see if there are any rules or patterns that link sets of graphs together.

Evidence ref
Verified by
Date

Tutor feedback

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## Challenge 5A5

Design your own code and write a message for a friend. They will then need the key to solve it.

Evidence ref
Verified by
Date

Tutor feedback

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# Sequences

Use matchsticks to make five different sequences of shape patterns, with at least four patterns in each sequence. Turn each sequence into a number pattern. Describe the patterns and the sequence using words, then write formulae for each sequence. Test your formula by extending your sequences

### Example

7	12	17	22

- Next term = previous term + 5
  - Difference between each term = 5
  - Number before the sequence starts = first term - difference between each term = 2
  - nth term formula =  $5n + 2$
- |                                |                                |
|--------------------------------|--------------------------------|
| $n = 5$ $5n + 2 = 25 + 2 = 27$ | $n = 6$ $5n + 2 = 30 + 2 = 32$ |
|--------------------------------|--------------------------------|

### Sequence 1

4			

- Next term = previous term
  - Difference between each term =
  - Number before the sequence starts = first term - difference between each term =
  - nth term formula =
- |         |         |
|---------|---------|
| $n = 5$ | $n = 6$ |
|---------|---------|

Sample