

REVISE PEARSON EDEXCEL GCSE (9–1)

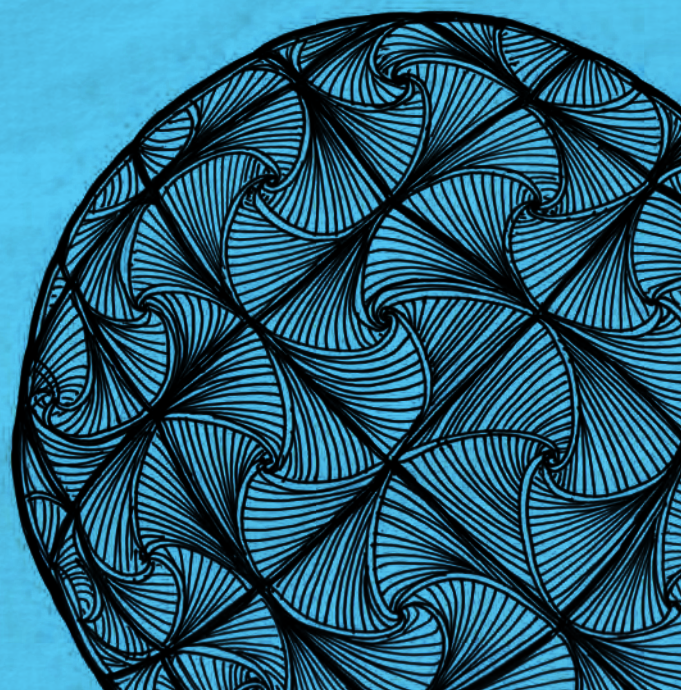
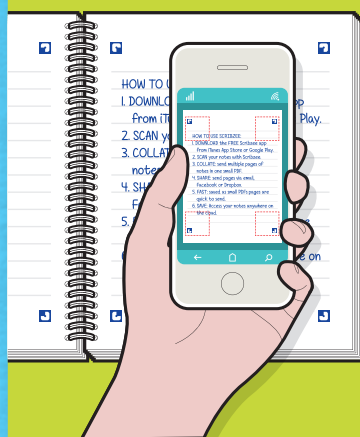
Mathematics

REVISION NOTEBOOK

Higher

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REVISE PEARSON EDEXCEL GCSE (9–1)
Mathematics
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REVISION NOTEBOOK

Series Consultant: Harry Smith

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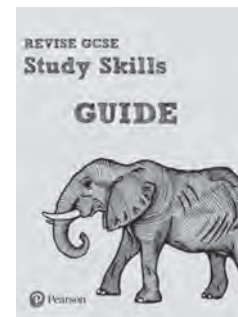
Revise GCSE Study Skills Guide 9781447967071

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www.pearsonschools.co.uk/revise



Making great revision notes

Making your own revision notes is one of the best ways to revise. Unlike in your exam, there are no right answers when it comes to making revision notes – you get to decide which methods of making notes work best for you.

I write down facts I need to remember, then cover them up and test myself.

I remember better if I use different colours and draw diagrams and tables.

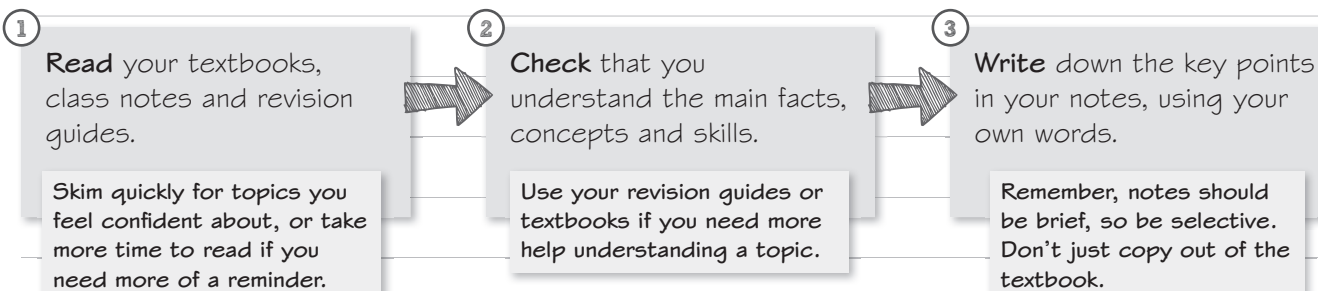
I like making posters and putting them up around my room.

I start every revision session by reviewing my notes from last time.



The 1-2-3 method

You can use this method to get started with your own revision notes:



Super-summaries

Once you have finished a page of notes, try to summarise the most important facts or skills in one or two bullet points. When you are scanning back through your notes, this summary can help to trigger your memory for **all** the notes on that page.

You can use these super-summaries to make **flashcards** later on in your revision, or scan through them quickly the night before the exam. You could even compile them all into a **one-pager** – this is **one side of A4** with a list of the key points or topics to remember for a particular exam.

Checklists

Write lists of things you need to remember. These could be:

- vocabulary or key words
- dates and places
- steps in a skill or process.

Bullets

Use short sentences starting on new lines rather than full paragraphs to make notes on:

- reasons or opinions
- advantages and disadvantages
- causes and effects.

Concept maps

Use a central heading and arms to write notes – just like this! Works great for:

- different examples of something
- links between topics.

Top note-making techniques

Boxes

Draw boxes to make parts of your notes stand out (or stay separate). For example:

- key formulae or golden rules
- case studies.

Keep it interesting

There are lots of simple ways to spice up your notes. Try some of the ideas on the right, or come up with your own **colour-code**, for example:

- black = normal text
- blue = tricky topic
- yellow highlighter = key word
- red arrow = connections.

CLOUDS

BANNERS

MAKE

LINKS

UNDERLINING

HIGHLIGHTING

STICK THINGS IN

Some dos and don'ts of revision notes

- | | |
|--|---|
| ✓ Use headings – structure your notes in digestible chunks. | ✗ Loose pages – don't tuck sheets of paper into your notes. They can fall out and get out of order. |
| ✓ Keep it neat – the best notes are ones you can read back over later in your revision. | ✗ Elaborate diagrams – don't waste a lot of time copying complicated graphs or pictures. You can always refer back to the textbook if you need to. |
| ✓ Recap and repeat – aim to look back over each set of notes at least once. | ✗ Long paragraphs – it's easier to revise from lists, bullets and key points than from dense passages of text. |
| ✓ Look after yourself – drink plenty of water, get plenty of sleep and take regular breaks. | |

Shorthand

Use your own shorthand symbols like these to speed up your note-making:

= the same	✓ advantage / pro	> bigger than
≠ not the same	✗ disadvantage / con	» much bigger than
→ links to / leads to	∴ therefore	∵ because

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A small bit of small print

Edexcel publishes Sample Assessment Material and the Specification on its website. This is the official content and this book should be used in conjunction with it.

Factors and primes

- ✓ The **factors** of a number are any numbers that divide into it exactly.
- ✓ A **prime number** has exactly two factors.

If you only remember one thing...



- Remember to draw a factor tree to help you with questions on prime factors.



Indices 1

✓ Learn these **index laws**:

$$a^m \times a^n = a^{m+n} \quad \frac{a^m}{a^n} = a^{m-n} \quad (a^m)^n = a^{mn}$$

✓ Anything raised to the **power 0** is equal to 1.

✓ Anything raised to the **power 1** is equal to itself.

If you only remember one thing...



- Learn the square numbers up to 15^2 and the cubes of 2, 3, 4, 5 and 10, and the corresponding square and cube roots.

☐☐☐



Indices 2

✓ Learn these index laws:

$$a^{-n} = \frac{1}{a^n}$$

$$a^{-1} = \frac{1}{a}$$

$$a^{\frac{1}{2}} = \sqrt{a}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$a^{\frac{1}{3}} = \sqrt[3]{a}$$

$$a^{\frac{m}{n}} = \left(a^{\frac{1}{n}}\right)^m$$

If you only remember one thing...



- When combining index laws, do the calculations one step at a time and show your working.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Calculator skills 1

- ✓ The first non-zero digit in a number is the first **significant figure**.
- ✓ Make sure you practise with **the same calculator** that you will use in the exam.

If you only remember one thing...



- You still need to show your working, even when you use a calculator.

☐☐☐



Fractions

- ✓ **Adding or subtracting** fractions – write the fractions with the same denominator.
- ✓ **Multiplying** fractions – multiply both the numerators and denominators.
- ✓ **Dividing** fractions – turn the second fraction upside-down and change \div to \times .

If you only remember one thing...



- Remember to convert any improper fractions to mixed numbers before calculating.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Decimals

✓ To convert a **fraction into a decimal**, divide the numerator by the denominator.

Fraction	$\frac{1}{100}$	$\frac{1}{20}$	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{3}{4}$
Decimal	0.01	0.05	0.1	0.5	0.2	0.25	0.75

If you only remember one thing...



- You can write a terminating decimal as a fraction with denominator 10, 100, 1000 etc.





Estimation

- ✓ If you add or multiply by a number then rounding down produces an **underestimate**.
- ✓ If you subtract or divide by a number then rounding down produces an **overestimate**.

If you only remember one thing...



- When estimating answers, round each number to one significant figure.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Standard form

✓ Numbers in standard form have two parts.

$$7.3 \times 10^{-6}$$

This part is a number
greater than or equal to
1 and less than 10

This part is a
power of 10

✓ You can enter numbers in standard form on a calculator using the $\times 10^x$ key.

If you only remember one thing...



- Numbers written in standard form have only one digit to the left of the decimal point.





Recurring decimals

- ✓ Recurring decimals have one digit or group of digits repeated forever.
- ✓ You can use algebra to convert a recurring decimal into a fraction. Here is the strategy:

Write the recurring decimal as n .



Multiply by 10, 100 or 1000.



Subtract to remove the recurring part.



Divide by 9, 99 or 999 to write as a fraction.

If you only remember one thing...



- To convert a recurring decimal to a fraction, start by writing it out longhand.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Upper and lower bounds



To find the **least** possible value:

- add or multiply by lower bounds
- subtract or divide by upper bounds.



To find the **greatest** possible value:

- add or multiply by upper bounds
- subtract or divide by lower bounds.



If you only remember one thing...



- If you are given **rounded** values in a calculation, start by writing down the lower and upper bounds for each one.





Accuracy and error

- ✓ An appropriate degree of accuracy is a value that the actual answer will **always** round to.
- ✓ An error interval shows the range of possible values for a rounded number.

If you only remember one thing...



- Use inequalities when writing an error interval.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Surds 1

✓ A surd is a square root that can't be written exactly as a decimal number.

✓ Learn these rules for surds:

$$\sqrt{ab} = \sqrt{a} \times \sqrt{b} \quad \text{so} \quad \sqrt{8} = \sqrt{4} \times \sqrt{2} = 2\sqrt{2}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \quad \text{so} \quad \sqrt{\frac{3}{25}} = \frac{\sqrt{3}}{\sqrt{25}} = \frac{\sqrt{3}}{5}$$

If you only remember one thing...



- Don't leave your answer as a square root if you can write it exactly, or if you are told to give it to a certain degree of accuracy.





Counting strategies

- ✓ To find the total number of possible combinations, **multiply** the number of choices for each option.

If you only remember one thing...



- When using the product rule of counting, read the question carefully to work out **how many choices** there are for each option.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Problem-solving practice 1

Use this page and the next page to make notes on problem-solving strategies that work for you, or to practise problem solving questions.

Lined area for notes and practice questions.

If you only remember one thing...



- If a question is worth more than 1 mark, that means you **must** show some workings.

☐☐☐



Problem-solving practice 2

If you only remember one thing...



- If you are stuck, write down a related formula, draw a sketch, or try the problem with easier numbers.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Algebraic expressions

- ✓ Use the index laws in algebra to simplify powers with the **same base**:

$$a^m \times a^n = a^{m+n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

- ✓ You need to square or cube **everything** inside a bracket.

If you only remember one thing...



- When simplifying expressions, work out number parts first, then consider each letter (base) one at a time.

☐☐☐



Expanding brackets

- ✓ Multiply the term outside the brackets by **everything** inside the brackets.
- ✓ Use **FOIL** or a **grid method** to expand a product of two brackets.

Lined area for working out solutions.

If you only remember one thing...



- 'Expand and simplify' means 'multiply out and then collect like terms'.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Factorising

- ✓ Factorising is the opposite of expanding brackets.
- ✓ When you factorise a **quadratic** expression, you might end up with two brackets.
- ✓ $a^2 - b^2 = (a + b)(a - b)$.

If you only remember one thing...



- Check your answers by multiplying out the brackets and comparing with the original expression.

☐☐☐



Linear equations 1

- ✓ To solve a linear equation you need to get the letter on its own on one side.
- ✓ Expand any brackets first, then collect like terms on one side of the equation.

If you only remember one thing...



- Always do the same operation to both sides of the equation.



Had a go ☐

Nearly there ☐

Nailed it! ☐





Linear equations 2

✓ Multiply every term by the LCM of the denominators to get rid of any fractions.



If you only remember one thing...



- Fractions work in the same way as brackets. You can write brackets around the numerator to be on the safe side.

☐☐☐