Name	Date started	Target end date

WJEC GCSE Mathematics and Numeracy (Double Award) — Question Pack

Every simple and compound interest question from the legacy WJEC GCSE Mathematics-Numeracy Higher tier papers (2016–2024), reorganised against t

REVISE
.wales

1.06 — Simple & Compound Interest

Spec 1.8.3, 1.8.4 — Unit 1 (calculator allowed)

Every simple and compound interest question from the legacy WJEC GCSE Mathematics-Numeracy Higher tier papers (2016–2024), reorganised against the 2025 specification points 1.8.3 (simple & compound interest) and 1.8.4 (multiple rates).

2025 SPECIFICATION

Estimated time for entire question pack: ~1 hours 44 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (69 marks across 15 questions).*

*You are advised to **not** attempt to complete all of this in one sitting.*

ABOUT THIS QUESTION PACK

This is a **focused single-topic practice pack**, not a single mock paper. Questions are organised against the 2025 specification. Questions are ordered chronologically by sitting, with custom-written and SAM questions at the end.

INSTRUCTIONS

Use black ink or black ball-point pen. Show all working — method marks are awarded for clear setup.

A calculator is allowed on every question in this pack (Unit 1 is the calculator-allowed paper).

Simple & Compound Interest — what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 1: calculator-allowed.

Simple interest 1.8.3

- $I = \frac{PRT}{100}$ — principal × rate × time, divided by 100.
- Interest is the same amount each year; the principal does not grow.
- Total amount after T years: $A = P + I$.
- Watch for "simple" vs "compound" in the wording — they give very different answers.

Compound interest 1.8.3

- $A = P\left(1 + \frac{r}{100}\right)^n$ — multiplier raised to the power of years.
- Each year's interest is added to the principal, then interest is calculated on the new total.
- Multiplier form: $m = 1 + r/100$, then $A = P \times m^n$.
- Depreciation uses the same formula with r negative (multiplier < 1).

Multiple rates (1.8.4) 1.8.4

- Different rate each year — chain the multipliers.
- $A = P \times m_1 \times m_2 \times \cdots \times m_n$.
- E.g. 24% drop year 1 then 13% drop per year: $A = P \times 0.76 \times 0.87^{n-1}$.
- Compounding more than once per year: $A = P\left(1 + \frac{r}{100k}\right)^{kn}$ where k is periods/year.

What this means in practice 1.8

- Work *forwards* (find final amount) and *backwards* (find original principal).
- Solve for n by iteration: keep multiplying until you cross the target value.
- For comparison questions, compute each scenario's final value — never compare rates alone.
- Calculator is allowed throughout Unit 1 (calc-allowed paper).

Crib sheet »

Simple & Compound Interest in one page

Quick-reference notes — revisit before each question. Don't use during the questions.

Simple interest

$$I = \frac{PRT}{100}$$

P principal, R rate (%), T years.

Total: $A = P + I$.

Compound (annual)

$$A = P\left(1 + \tfrac{r}{100}\right)^n$$

n = years.

Multiplier form: $A = P \cdot m^n$ with $m = 1 + r/100$.

Compound (k times / yr)

$$A = P\left(1 + \tfrac{r}{100k}\right)^{kn}$$

$k = 12$ monthly, 4 quarterly, 2 half-yearly.

Nominal rate ≠ AER when $k > 1$.

Depreciation

$$V = P\left(1 - \tfrac{r}{100}\right)^n$$

Multiplier $m = 1 - r/100 < 1$.

E.g. car drops 15%/yr → $m = 0.85$.

Multipliers (cheat sheet)

+5% → $\times 1.05$

−24% → $\times 0.76$

+7.5% → $\times 1.075$

Forgetting the "1+" is the #1 mistake.

Chaining rates

5% then 3%: $P \times 1.05 \times 1.03$.

24% drop, then 13% drop each year: $P \times 0.76 \times 0.87^{n-1}$.

Solving for n

By iteration: list values year-by-year until you cross the target.

Round *up* — you need to reach or exceed the target.

Working backwards

Final amount A given, find P:

$$P = \frac{A}{(1 + r/100)^n}.$$

Common traps

- Mixing up simple vs compound.
- Forgetting to add interest back to principal.
- Nominal rate vs equivalent annual rate.
- Off-by-one years (start of vs end of year n).

Examiner only

2. The price of softwood changes each year.
The price has increased by 6% per annum for each of the last **5 years**.
Before this, the price had decreased by 2% per annum.
Seven years ago the price of softwood was £34 per m^3.

Calculate the current price of softwood. [3]

Current price of softwood is £ ..... per m^3

Examiner only

10. Huw wants to open a savings account.
Here are the details of savings accounts advertised by two local Welsh banks.

Banc Padarn	**Banc Teilo**
Nominal interest rate of 1·98% per annum Interest paid monthly	AER 1·99%

(a) (i) What is 1·98% as a decimal?
Circle your answer. [1]

0·0198 0·198 1·098 1·98 98·0

(ii) Which of these two banks should Huw choose in order to gain the most interest per annum?
You must show your working. [4]

Examiner only

(b) Interest earned from savings is taxable, according to the table below.

Tax rates for savings	
Basic rate taxpayer	20% on annual interest earned above £1000
Higher rate taxpayer	40% on annual interest earned above £500

Matthew is a higher rate taxpayer.
Therefore, any savings interest he earns over £500 within a year is taxed at 40%.

On 1st May 2016, he invested £150 000 in a savings account that pays interest at a rate of 1·98% **per annum**.

(i) What is this interest rate **per month**, written as a decimal?
Circle your answer. [1]

0·0033 0·00495 0·00165 0·0099 0·0066

Savings interest is added at the end of every month.

(ii) Calculate the date when the interest that Matthew earned went above his annual tax-free limit, and the amount of tax he would have to pay on this interest if he had closed the account on this date. [5]

Examiner only

1. Mali's scooter depreciated (decreased) in value by 24% in the **first** year.
In all further years, her scooter depreciated by 13% of its previous year's value.
She originally paid £850 for her scooter.
Calculate the value of Mali's scooter after 7 years. [3]

After 7 years, the value of Mali's scooter was £ .....

2. Sanjay stacks three boxes in a pile.
The heights of the boxes are 25 cm, 36 cm and 47 cm.
They are all measured correct to the nearest centimetre.
What is the greatest possible height of the stack of the three boxes? [2]

Greatest possible height of the stack of three boxes is ..... cm

Examiner only

10. Fatima wants to invest some money in a savings account.
She has picked up leaflets from two building societies advertising their high-interest savings accounts.

'Bannau' account	'Eryri' account
Nominal annual rate of 3·85%	Nominal annual rate of 3·86%
Interest paid monthly	Interest paid every 6 months

By comparing AERs, which account will offer Fatima the better interest rate on her investment?
You must show all your working. [5]

Examiner only

5. Teleri needs £8000 to pay a deposit for a new house.
She already has £7500.

Teleri decides to invest the £7500 in a bank account that pays interest at a rate of 0·31% every month.
She does not plan to make any further payments into this account.

Calculate the number of months Teleri will need to wait until she has enough money in the account to pay the deposit of £8000. [3]

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Examiner only

7. Iestyn opened a savings account on 1 August 2017, investing £2800.
On 1 October 2017, he viewed his savings account online.
The table below shows all the transactions that had taken place since he opened the account.

Date	Details	Paid in (£)	Paid out (£)	Balance (£)
01/08/17	Account opened	2800.00		2800.00
31/08/17	Interest	14.00		2814.00
30/09/17	Interest	14.07		2828.07

(a) Calculate the nominal interest rate per annum. [3]

(b) Calculate the AER the account was paying.
Give your answer as a percentage, correct to 2 decimal places. [3]

Examiner only

4. *(a)* Kingsley invests £3000 in an account that pays 2% compound interest per annum. He does not make any further payments into his account. He does not withdraw any money from his account.

How much will Kingsley have in his account after **two years**? [3]

Amount in Kingsley's account after two years is £ .....

Examiner only

(b) Kingsley buys a portable *Bluetooth* speaker.
The speaker has been reduced by 20% in a sale.
He pays £72 for the speaker in the sale.
What was the original price of the speaker? [2]

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Original price of the speaker is £ .....

Examiner only

8. Cellan is planning to invest a sum of money into a savings account.

Cellan has picked up a leaflet describing an account offered by a local bank.
The details of the account are shown below.

Account name	Minimum term	Minimum investment	Interest paid	Nominal annual interest rate
The Gower	1 year	£1000	Every 6 months	4%

(a) Calculate the Annual Equivalent Rate (AER) that *The Gower* account is offering.
Give your answer as a percentage. [5]

AER = ... %

(b) Give one reason why banks use AER. [1]

Examiner only

(c) Cellan decides to invest his savings of £3000 into a 'Gower' savings account. He plans to save enough money to buy a motorbike costing £3200.

Calculate how much short of the £3200 Cellan would be after 1 year. [4]

Examiner only

3. (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

On 1st June, Delyth budgets for her next electricity bill.
This bill will be for the months of June, July and August.
Her bill will have to be paid at the beginning of September.

She knows:

- the standing charge is £8 **per month**,
- her meter reading on 1st June is 20 150 kWh,
- her estimate for her meter reading on 31st August is 20 950 kWh,
- her agreement states that electricity costs 23p per kWh,
- VAT at 5% is payable on the total of the standing charge and the cost of the electricity used.

Calculate how much she should budget each month so that she is able to pay her next electricity bill. [7 + 2 OCW]

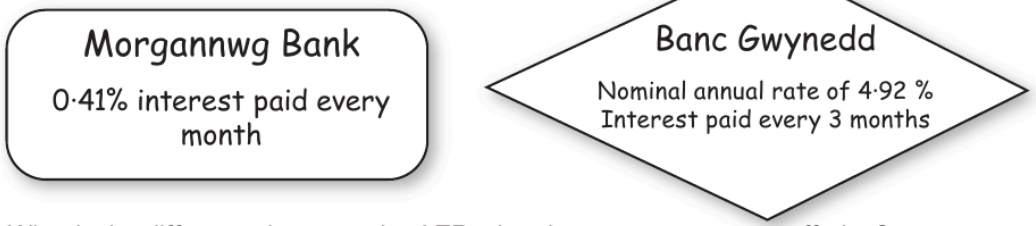
Examiner only

(b) Delyth invested £500 in a saver bank account 20 years ago.
She did not withdraw money or make any other payments into this account.
The bank paid 2·2% compound interest per annum during the first 5 years.
Compound interest at 1·6% per annum was paid for the remaining 15 years.

Delyth closes the account after 20 years.
How much money should she receive? [4]

Examiner only

6. Simon has some money to invest in a savings account.
Two banks have sent him details of their *Special 1-Year Saver* accounts.
He plans to make only one payment into the account and not withdraw any money during the year.



What is the difference between the AERs that the two accounts are offering?
Give your answer as a percentage correct to 2 decimal places. [5]

Difference in AERs = ... %

Examiner only

3. (a) 10 years ago, Matteo bought a car for £4500.
His car depreciated in value by 20% in the **first** year.
In each of the following years, his car depreciated by 14% of its previous year's value.

Show that the value of Matteo's car is now less than £950.

You must show all your working. [3]

(b) Matteo's car insurance has increased by 25% from the amount he paid last year.
His car insurance is £750 this year.

Calculate the amount Matteo paid for his car insurance last year. [2]

Matteo paid £ ..... for his car insurance last year.

Examiner only

(c) The diagram below shows the front of Matteo's garage.

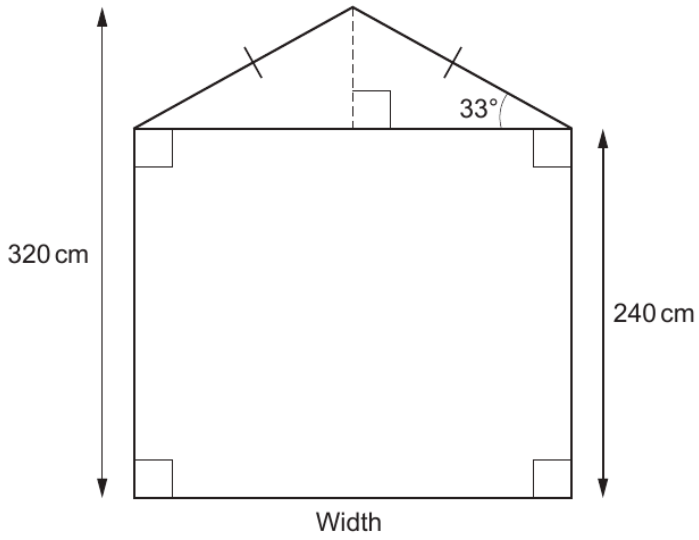


Diagram not drawn to scale

Calculate the width of Matteo's garage. [5]

Examiner only

(d) The length of Matteo's car is 400 cm, correct to the **nearest 10 cm**.
The length of his garage is 550 cm, correct to the **nearest 10 cm**.

When Matteo parks his car, he leaves exactly 70 cm between the car and the back wall of the garage.

Calculate the maximum length of the space between Matteo's car and the garage door.
[3]

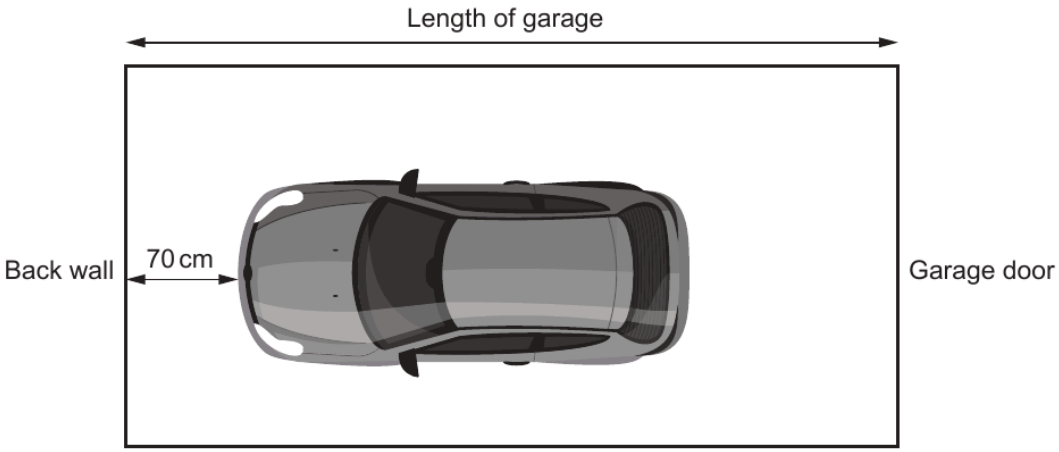


Diagram not drawn to scale

Examiner only

6. Rebecca needs to save £10 000 for the deposit to buy a new house.
She has opened a savings account with Dragon Building Society. The account has a nominal annual rate of 5·4%, with interest paid on the last day of every month.

The formula for calculating the amount of money in the account at the end of every month is:

$$A = M\left(\frac{\left((1+r)^n - 1\right)(1+r)}{r}\right)$$

where:

A is the amount of money in the account at the end of every month,
M is the amount deposited into the account on the 1st day of each month,
r is the **monthly** interest rate written as a decimal,
n is the number of months the account has been open.

Rebecca opened the account on 1st August 2022, depositing £335 into the account.
She will deposit £335 into the account on the 1st day of every month.

(a) At the end of which month, and in which year, will Rebecca have the £10 000 she needs?
You must show all your working. [4]

Rebecca will have the £10 000 at the end of ..... in the year .....

Examiner only

(b) Calculate the AER for Rebecca's savings account.
Give your answer as a percentage, correct to 2 decimal places. [2]

(c) Rebecca's friend, Seren, opened a similar savings account with Dragon Building Society on 1st June 2020, depositing £300.
Seren then deposited £300 into the account on the 1st day of every month.
By 30th November 2021, Seren had £5636.84 in the account.

How much interest had Seren received?
Circle your answer. [1]

£236.84 £636.84 £836.84 £3836.84 £4136.84

Examiner only

5. A car was bought in 1973 for £2500.

In the first year, this car depreciated by 23% of its value.
In each of the following 39 years, it depreciated by 4% of its value in the previous year.

The car then started to increase in value.
In each of the next 10 years, it increased by 14% of its value in the previous year.

Calculate the value of the car after these 50 years.
You must show all your working. [4]

The value of the car after 50 years is £ .....

Examiner only

5. (a) Delia invests £4000 in an account that pays 3% compound interest per annum. She does not withdraw money or make any other payments into her account.

How much will Delia have in her account after **two years**? [3]

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Amount in Delia's account after two years £ .....

(b) Delia bought a gold bracelet at a car boot sale a few years ago.

(i) Delia's bracelet has increased in value by 40%. Her gold bracelet is now worth £42.

Calculate how much Delia paid for the bracelet in the car boot sale. [2]

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Delia paid £ .....

Examiner only

(ii) The density of the gold in Delia's bracelet is $20\,g/cm^3$.
The bracelet has a mass of 6×10^{-3} **kilograms**.

Calculate the volume of Delia's bracelet.
Give your answer in cm^3. [3]

Examiner only

7. Isaac and his sister Mari are both going to open savings accounts.

(a) Isaac decides to invest some of his savings in the Hereford Saver account.
Details of the account are shown below.

Hereford Saver account

Monthly interest rate 0·26%

Calculate the AER that the Hereford Saver account offers.
Give your answer as a percentage. [2]

Examiner only

(b) Mari invests £3000 in the Silver Plus savings account.
Details of the account are shown below.

Account name	Nominal annual rate	Interest paid
Silver Plus	2·48%	Quarterly

Mari does not withdraw any money or make any further payments into the account.
Mari closes the account after 10 years.

Calculate the percentage increase in the value of her investment.
You must show all your working. [5]