Name	Date started	Target end date

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

Annual Percentage Rate (APR), loans and mortgages. Pulls together legacy WJEC Higher questions, a SAM question for the new 2025 spec, and custom-writt

REVISE
.wales

1.08 — APR, loans & mortgages

Spec 1.8.6 — Unit 1 (calculator allowed)

Annual Percentage Rate (APR), loans and mortgages. Pulls together legacy WJEC Higher questions, a SAM question for the new 2025 spec, and custom-written questions to fill spec coverage.

2025 SPECIFICATION

Estimated time for entire question pack: ~1 hours 51 minutes

*Derived from the GCSE Higher pace of **~1.5 min/mark** (74 marks across 10 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).

APR, loans & mortgages — what the new spec asks

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

APR definition 1.8.6

- Annual Percentage Rate: the effective annual cost of borrowing.
- Includes interest and (sometimes) fees.
- Used to compare loan/credit products on a like-for-like basis.

Monthly payment formula 1.8.6

- $M = \dfrac{rL}{1-(1+r)^{-n}}$ — given on the page.
- r is the monthly rate, n is the number of monthly payments.
- Convert APR to monthly: $r = (1+\text{APR})^{1/12} - 1$.

Total cost of credit 1.8.6

- Total paid = number of payments × monthly payment.
- Cost of credit = total paid − amount borrowed.
- Lower APR *or* shorter term reduces total cost.

Mortgages 1.8.6

- Same formula as personal loans, but with n in the hundreds.
- Term lengths of 20, 25, 30 years.
- Compare monthly affordability against total cost of credit.

Crib sheet »

APR, loans & mortgages in one page

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

Monthly rate from APR

$$r = (1 + \text{APR})^{1/12} - 1$$

APR is the *effective* annual cost; r is the matching monthly rate.

Always use APR as a decimal: 6.9% ⇒ 0.069.

Monthly payment

$$M = \frac{r \cdot L}{1 - (1 + r)^{-n}}$$

L = loan amount, r = monthly rate, n = total months.

Formula always supplied on the page.

Total cost of credit

Total paid = $n \times M$.

Cost of credit = total paid − L.

Mortgages vs loans

Same formula. Mortgages span 20–30 years; personal loans 1–7.

Long terms = lower monthly, much higher total interest.

Choosing a deal

Lowest APR is usually best on cost of credit.

BUT a shorter term at higher APR can still cost less in total.

Always compare total interest, not just APR.

Solving for APR by trial

If M is given, try APR values and see which produces the matching M.

Use a sensible starting point (e.g. 8%) and bracket up/down.

Examiner only

2.

Olga took out a high-interest loan for £400.
She paid back £49 per month for 20 months to clear the loan.
Calculate the total interest that Olga paid as a percentage of the original loan. [4]

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

7. Carys is buying a new caravan, priced at £20 000.
She is going to take out a loan to buy the caravan.

The table below shows her finance options.
The monthly payment is missing from Option B.

	Option A	Option B
Deposit	£0	£2000
Loan amount	£20 000	£18 000
Loan period	5 years	4 years
APR of the loan	3·3%	3·3%
Monthly payment	£362.05	

The formula for calculating the monthly payment on a loan is

$$M = \frac{r \times L}{1-(1+r)^{-n}}$$

where:

- M is the amount of each monthly payment
- L is the loan needed
- r is the **monthly** interest rate as a decimal
- n is the number of **months** taken to pay back the loan.

(a) Show that Carys's monthly payment for Option B would be £400.81, correct to the nearest penny. [3]

(b) Carys chooses Option B, rather than Option A.
Calculate how much Carys would save on the total amount paid for the caravan. [3]

Carys would save £ .....

He has some money to pay as a deposit, and then he will be taking out a loan from his bank to pay the balance.

The details of his finance agreement are shown below.

Deposit	£5000
Loan amount	£17 000
Loan period	7 years
Annual Percentage Rate (APR)	7.5%

Matthew will be making monthly repayments to pay back the loan in 7 years.
The formula for calculating the monthly repayment on a loan is

$$M = \frac{r \times L}{1 - (1 + r)^{-n}}$$

where:

- M is the amount of each monthly repayment
- L is the loan needed
- r is the **monthly** interest rate as a decimal
- n is the number of **months** taken to pay back the loan.

(a) Calculate Matthew's monthly repayment on the loan. [3]
Give your answer correct to the nearest penny.

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Matthew's monthly repayment is £ .....correct to the nearest penny.

Calculate the saving Matthew would make on the total amount paid for the car if he took out the loan for 6 years rather than 7 years. [2]

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Spec wording: "calculate, use and apply Annual Percentage Rate (APR) when comparing financial products, including mortgages"

Reference: WJEC SAM Unit 1 Higher Q12 (Matthew's car loan, formula given on the page) and legacy num_2023_w_U2_H Q7 (Carys's caravan loan).

The monthly payment formula is supplied on the page for every question that requires it:

$M = rL / (1 - (1 + r)^{-n})$

where M is the monthly payment, L is the amount borrowed, r is the monthly interest rate (as a decimal) and n is the total number of monthly payments.

Carys is buying a small touring caravan priced at £14,800.

She pays a deposit of £2,800 and borrows the rest from her bank.

The loan is taken over 5 years at an APR of 6.9%.

(a) Show that the monthly interest rate, correct to 5 decimal places, is r = 0.00558. [2]

(b) Use the formula above to calculate Carys's monthly payment, correct to the nearest penny. [3]

(c) Work out the total amount of interest that Carys will pay over the 5 years of the loan. [3]

Owain wants to buy a new motorbike. Two finance companies offer him the loan he needs of £6 500.

Company	Term	APR
BikeFinance	3 years	8.4%
RideNow	4 years	6.9%

(a) Calculate the monthly payment Owain would make with each company. [6]

(b) Owain says, "RideNow is the better deal because the APR is lower." By calculating the total cost of credit for each company, state whether you agree. Give a reason for your answer. [3]

Question 7 *Custom-authored for revise.wales · 10 marks* **10 marks**

Megan and Dafydd are buying their first house for £225 000. They have saved a deposit of £45 000.

They are choosing between two mortgages, both for the remaining amount.

Mortgage	Term	APR
Mortgage A	25 years	4.5%
Mortgage B	30 years	4.5%

(a) Show that the monthly interest rate, correct to 6 decimal places, is r = 0.003675. [2]

(b) Calculate the monthly payment for Mortgage A. [3]

(c) Calculate the monthly payment for Mortgage B. [2]

(d) Megan says, "Mortgage B is better because we pay less each month." Dafydd disagrees. Using your answers above, comment on who is correct and justify your answer. [3]

Question 8 *Custom-authored for revise.wales · 7 marks* **7 marks**

Bethan is taking out a loan of £9 000 to refurbish her kitchen. The loan is over 4 years.

She is offered two products by her bank:

- **Product 1 (Fixed):** APR of 7.2% fixed for the full 4 years.
- **Product 2 (Variable):** Year 1 APR of 4.9%, then APR of 8.5% for years 2, 3 and 4.

(a) Calculate the monthly payment for Product 1. [3]

(b) For Product 2, the bank recalculates the monthly payment after Year 1 based on the outstanding balance and the new APR.

After Year 1, Bethan's outstanding balance is £6 944.21. Use the formula to calculate her new monthly payment for the remaining 3 years. [3]

(c) Which product gives the lower total cost of credit over the 4 years? Show your reasoning. [1]

Question 9 *Custom-authored for revise.wales · 6 marks* **6 marks**

Rhys is buying a van for his plumbing business. The cash price is £18 500.

He cannot afford to pay cash, so takes a loan of £18 500 over 5 years.

His monthly payment is £374.92.

(a) Work out the total amount Rhys will pay back over the 5 years. [1]

(b) Work out the total cost of credit. [1]

(c) Use the formula on the page, by trial and improvement or otherwise, to estimate the APR Rhys has been charged. Give your answer correct to 1 decimal place. [4]

Eluned is buying a new car priced at £24 000. She can choose how much deposit to put down.

She will borrow the remaining amount over 5 years at an APR of 6.5%.

(a) Show that the monthly interest rate, correct to 5 decimal places, is r = 0.00526. [1]

(b) Complete the table below. Give monthly payments correct to the nearest penny. [6]

Deposit	Amount borrowed	Monthly payment	Total cost of credit
£2 400	£21 600	?	?
£6 000	£18 000	?	?
£9 600	£14 400	?	?

(c) Eluned has £6 000 in savings. She is considering paying a £2 400 deposit and keeping £3 600 for emergencies, OR paying the full £6 000 as a deposit. By how much would she save in total interest by paying the larger deposit? [2]

End of question pack