

26. Ratio, Proportion and Rates of Change

Using percentages to calculate mortgage affordability.

Sam is hoping to get on the property ladder and purchase his first home. To do this, Sam will need to apply to a bank for a mortgage, which is a loan provided by banks to people who are buying property. As banks will not lend the full amount required to buy a property, Sam will also need to put down a deposit of 5% to 10% of the property's value in order to secure a mortgage.

1. Sam has savings of £25,000 and wants to buy a house worth £240,000.
 - a. If Sam uses all of his savings as a deposit, what percentage of the property price would his deposit be?

$$25000 \div 240,000 = 10.4\%$$

- b. What would Sam's total mortgage loan be if he uses all his savings as a deposit?

$$£240,000 - £25,000 = £215,000$$

2. The maximum mortgage that the bank will lend someone is four times their annual salary (or, if a couple is taking out the mortgage together, their combined salaries). If Sam earns £35,000 a year, will he be able to get the mortgage he needs to buy the £240,000 house?

$$£35,000 \times 4 = £140,000$$

$$£215,000 > £140,000$$

Therefore, Sam won't be able to get a mortgage for the house.

3. Sam and his partner Jane decide to team up to buy the house. Jane has a maximum of £20,000 that she can contribute towards a deposit and earns £30,000 a year.

- a. Given their combined available savings, what is the smallest mortgage that Sam and Jane would need in order to buy the £240,000 house?

$$£240,000 - £25,000 - £20,000 = £195,000$$

- b. The bank requires a minimum deposit of 5% of the property price. If Sam and Jane put down only the minimum 5% deposit, will the bank approve their mortgage for the amount they would need to borrow to purchase the £240,000 house?

$$0.05 \times 240,000 = 12,000$$

$$240,000 - 12,000 = £228,000$$

- c. What is the minimum deposit that Sam and Jane would need to put down on the house in order to meet the bank's lending limit of four times their annual salaries?

$$0.05 \times 240,000 = 12,000$$

$$240,000 - 12,000 = £228,000$$

Loan-to-value bracket	Mortgage interest rate	Monthly repayment
Up to 95%	6.61%	£500
Up to 90%	6.48%	£300
Up to 85%	6.32%	£280
Up to 75%	6.12%	£550
Up to 60%	5.96%	£930

4. As shown in the table below, banks will charge different rates of interest on a mortgage based on a buyer's "loan-to-value" – or LTV – ratio. "Loan" refers to the value of the mortgage and "value" refers to the property price, and despite being called a "ratio", LTV is usually expressed as a percentage.

- a. If Sam and Jane put down a £25,000 deposit on the £240,000 house, which LTV bracket would they fall into?

$$215,000 \div 240,000 \times 100 = 89.5\% = \text{up to 90\% group}$$

- b. If Sam and Jane use all their savings for a house deposit, what is the lowest LTV bracket that Sam and Jane could benefit from when buying the £240,000 house?

$$240,000 - 45,000 = 195,000$$
$$195,000 \div 240,000 \times 100 = 81.25\% \text{ therefore they would be in the 'up to 85\%'} \\ \text{group.}$$

- c. If a family member offers to lend Sam and Jane an additional £15,000 to use as their deposit, what is the lowest monthly payment that they would be able to get on their mortgage?

$$240,000 - 60,000 = 180,000$$
$$180,000 \div 240,000 \times 100 = 75\% \text{ therefore they would be in the 'up to 75\% group'} \\ \text{and would get a monthly repayment of £1195.}$$

