Fractions and percentages

1 Uzma invests £4000 in a bank account for 1 year.
Interest is paid at a rate of 2.5% per annum.
How much interest will Uzma get at the end of 1 year?

\[
\frac{2.5}{100} \times £4000 = £\hspace{1cm}
\]

2 A farmer has 48 llamas.
30 of the llamas are female.
(a) Work out 30 out of 48 as a percentage.

\[
\frac{30}{100} \times 100 = \hspace{1cm}
\]

(b) Write the number of pregnant female llamas as a fraction of the 48 llamas.
Give your answer in its simplest form.

3 Meera works in an electrical shop.
Each week she gets paid £160 plus 15% of the value of the goods she sells.
One week Meera sold £3200 of goods.
Work out the total amount she was paid this week.

\[
£\hspace{1cm}
\]

4 Liam’s annual income is £16 000.
He pays \( \frac{1}{5} \) of the £16 000 in rent.
He spends 15% of the £16 000 on food.
Work out how much of the £16 000 Liam has left.

\[
£\hspace{1cm}
\]

5 At an outdoor centre, 140 students each choose one activity.
\( \frac{1}{7} \) of the students choose rock climbing.
\( \frac{3}{7} \) of the students choose rafting.
All the rest of these students choose abseiling.
How many students choose abseiling?

\[
\hspace{1cm}
\]
Reverse percentages and compound interest

1. Linda bought a new car for £18 000.
   Each year, the car depreciated in value by 15%.
   Work out the value of the car after 4 years.

   Multiplier = \( 1 - \frac{15}{100} \) = 

   Value after 4 years = \( 18000 \times (\text{\ldots\ldots\ldots})^4 \)
   = 
   = £

2. Jalin invested £3200 in a savings account for 3 years.
   He was paid compound interest at a rate of 3.5% per annum.
   Work out how much was in the account after 3 years.

   £

3. In a sale, normal prices are reduced by 35%.
   The sale price of a DVD player is £403.
   Work out the normal price of the DVD player.

   Multiplier = \( 1 - \frac{35}{100} \) = 

   Normal price = £
   = £

4. Jill’s weekly pay this year is £460.
   This is 15% more than her weekly pay last year.
   Dave says, ‘This means Jill’s weekly pay last year was £391.’
   Dave is wrong. Explain why.

5. Pete invested £5100 for \( n \) years in a savings account.
   He was paid 4.5% per annum compound interest.
   At the end of the \( n \) years he had £6641.53 in the savings account.
   Work out the value of \( n \).

Choose some values for \( n \) and work out the amount in the savings account after \( n \) years.
Arithmetic sequences

1. Here are the first five terms of an arithmetic sequence.
   
   \[1\quad 5\quad 9\quad 13\quad 17\]

   Find an expression, in terms of \(n\), for the \(n\)th term of the sequence.
   
   \[
   \text{zero term } + \ldots + \ldots + \ldots + \ldots + \ldots
   \]
   
   \[
   \ldots 1\quad 5\quad 9\quad 13\quad 17
   \]

   \[
   n\text{th term} = \ldots \ldots n + \ldots \ldots = \ldots \ldots \ldots \ldots \ldots
   \]

   (2 marks)

2. Here are the first five terms of an arithmetic sequence.
   
   \[17\quad 12\quad 7\quad 2\quad -3\]

   Find an expression, in terms of \(n\), for the \(n\)th term of the sequence.

   \[
   \ldots \ldots \ldots \ldots \ldots
   \]

   (2 marks)

3. (a) Here are the first five terms of an arithmetic sequence.
   
   \[3\quad 7\quad 11\quad 15\quad 19\]

   Find an expression, in terms of \(n\), for the \(n\)th term of the sequence.

   \[
   \ldots \ldots \ldots \ldots \ldots
   \]

   (2 marks)

   (b) Paul says that 72 is a term in this sequence.

   Paul is wrong. Explain why.

   \[
   \ldots \ldots \ldots \ldots \ldots
   \]

   (1 mark)

4. (a) The \(n\)th term of a sequence is \(8n + 3\)

   Write down the first three terms of this sequence.

   \[
   \text{1st term } n = 1 \quad 8 \times 1 + 3 = \ldots \ldots \ldots
   \]

   \[
   \text{2nd term } n = \ldots \ldots \quad 8 \times \ldots \ldots + 3 = \ldots \ldots \ldots
   \]

   \[
   \text{3rd term } n = \ldots \ldots \quad 8 \times \ldots \ldots + 3 = \ldots \ldots \ldots
   \]

   (2 marks)

   (b) Jenny says that 45 is a term in this sequence.

   Jenny is wrong. Explain why.

   \[
   \ldots \ldots \ldots \ldots \ldots
   \]

   (1 mark)

5. The \(n\)th term of a sequence is \(3n - 1\)

   Work out the 50th term of this sequence.

   \[
   \ldots \ldots \ldots \ldots \ldots
   \]

   (1 mark)