# Using mathematical techniques

When quantitative data is presented in numerical or graphical form, it may be necessary to carry out mathematical calculations to interpret and explain the data. The numerical data could include:

- the size/value of the retail sector
- sales revenue
- profits/losses
- economic data
- sales quantities
- market share
- market research data
- footfall.

## Percentages

Divide one number (the part) by another (the whole) and multiply the result by 100.

**Example:**

$$\frac{15}{50} \times 100 = 30\%$$

## Percentage changes

$$\frac{\text{Difference between figures (new – original)}}{\text{Original figure}} \times 100$$

For example, Olivia runs a pet shop that sells dog and cat food. In 2020, her shop made an annual sales turnover of £92 000. In 2021, Olivia's annual sales turnover was £95 000. Olivia wants to know by how much her sales changed between the two years.

$$\frac{3000}{92\,000} \times 100 = 3.3\%$$

Therefore, Olivia's sales increased by 3.3% between 2020 and 2021.

## Averages

Add up the figures provided and divide the total by the number of items you have added up.

For example, Gifts Online has the following sales revenue for the last six months:

| | | | | | |
|---|---|---|---|---|---|
| £1500 | £1800 | £1400 | £2100 | £1600 | £1500 |

To calculate the average sales revenue for the six months, add up the six monthly figures:

$$1500 + 1800 + 1400 + 2100 + 1600 + 1500 = £9900$$

Then, divide this by six:

$$\frac{9900}{6} = £1650$$

## Sales revenue

Sales revenue is calculated by multiplying the selling price per unit by the quantity sold.

For example, Junaid sold 121 customised mugs online at £9.99 each. His sales revenue is:

$$121 \times 9.99 = £1208.79$$

## Profit/loss

Profit or loss is calculated by subtracting the costs from the sale revenue.

For example, Junaid's total cost per mug is £4.85. His profit per mug is:

$$9.99 - 4.85 = £5.14$$

His total profit is the total mugs sold multiplied by profit per mug:

$$121 \times 5.14 = £621.94$$