

As outcomes, Year 8 pupils should, for example:

Use vocabulary from previous year and extend to: sign change key...

Know how to:

- Use the sign change or +/- key where appropriate.
- Use the memory and/or bracket keys, and select the correct key sequence to carry out complex calculations.
- Key in fractions, recognise the equivalent decimal form, and use this to compare and order fractions.
- Use the fraction key, including to enter time, e.g. 3 hours 25 minutes = $3\frac{25}{60}$ hours.
- Use the cube and cube root keys, if available.
- Consider the approximate size of an answer before and after a calculation and, where necessary, check it appropriately.

Use a **calculator** to evaluate correctly complex expressions such as those with brackets or where the memory function could be used.

For example:

- Use a calculator to work out

$$4 \times (6.78)^2$$

Know how to:

- Recognise recurring decimals when they are rounded on the calculator, e.g. $2 \div 3$ is displayed as 0.666 66667.
- Recognise that if, for example, $\sqrt{3}$ is shown to be 1.732051 then $(1.732051)^2 \approx 3$.

Link to rounding numbers to one or two decimal places (pages 42–5), converting fractions to decimals (pages 64–5), working with integers, powers and roots (pages 48–59).

As outcomes, Year 9 pupils should, for example:

Use vocabulary from previous years and extend to: constant... reciprocal...

Know how to:

- Use the constant, π , sign change, power (x^y), root and fraction keys to evaluate expressions.
- Use the reciprocal key ($1/x$).

For example:

- Add on 101 repeatedly using the constant key. How long is the digit pattern maintained? Explain why.
- Find the circumference of a circle with radius 8 cm to two decimal places.
- Calculate 6^7 , $\sqrt[4]{625}$, $\sqrt{(57.6/\pi)}$, $\sqrt{(15.5^2 - 3.7^2)}$.
- Use a calculator to work out the answer as a fraction for $\frac{12}{19} + \frac{17}{22}$.

Use a **calculator** to evaluate more complex expressions such as those with nested brackets or where the memory function could be used.

For example:

- Use a calculator to work out:

$$\text{a. } \frac{45.65 \times 76.8}{1.05 \times (6.4 - 3.8)} \qquad \text{c. } \{(4.5)^2 + (7.5 - 0.46)\}^2$$

$$\text{b. } 4.6 + (5.7 - (11.6 \times 9.1)) \qquad \text{d. } \frac{5 \times \sqrt{(4.5^2 + 6^2)}}{3}$$

Understand how a **scientific calculator** presents large and small numbers in standard form, linking to work in science.

Link to multiplying by powers of 10 and writing numbers in standard form (page 39).

Use a **calculator** to investigate sequences involving a reciprocal function, such as:

$$x \rightarrow \frac{1}{x-1}$$

Link to reciprocals (pages 82–3).

Link to rounding numbers to one or two decimal places (pages 42–5), converting fractions to decimals (pages 64–5), working with integers, powers and roots (pages 48–59).