1.7 Further exponents and logarithms

Checklist

What you should know

By the end of this subtopic you should be able to:

- interpret $a^{\frac{1}{n}}$ as $\sqrt[n]{a}$
- use $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = (a^{\frac{1}{n}})^m$ to manipulate and simplify expressions containing rational exponents
- evaluate simple $a^{\frac{m}{n}}$ expressions without a calculator
- rewrite exponential equations in any base in equivalent logarithmic form using $a^x = b \Leftrightarrow \log_a b = x$ for $a > 0,\ a \neq 1$ and $b > 0$
- evaluate logarithms with and without a calculator
- understand that

$$\log_a a^m = m$$

$$\log_a 1 = 0$$

$$\log_a a = 1$$

$$a^{\log_a m} = m$$

$$\mathrm{e}^{\ln m} = m$$

- use the laws of logarithms to condense or expand logarithmic expressions
- use the change of base formula to rewrite logarithms in a different base
- solve exponential equations by equating bases
- solve exponential equations by using logarithms.