Learn all the foundation key facts and remember these top tips!

Recurring Decimals

To change a recurring decimal to a fraction, follow these steps. Your aim is to ensure you have two decimals which have the same numbers after the decimal point.

E.g. change $0.2\dot{3}\dot{5}$ to a fraction.

Let $x = 0.2\dot{3}\dot{5}$

$10x = 2.\dot{3}\dot{5}$

$1000x = 235.\dot{3}\dot{5}$

Subtracting these two gives

$990x = 233$

Solving gives

$x = \frac{233}{990}$

Surds

$\sqrt{a} \times \sqrt{b} = \sqrt{ab}$

$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

$(\sqrt{a})^2 = a$

To **simplify** a surd, write it as the product of two factors, one of which must be a square number.

E.g. $\sqrt{50} = \sqrt{(25 \times 2)}$

$= 5\sqrt{2}$

To **rationalise the denominator** of a fraction which has just one term on the bottom, you can multiply both the numerator and denominator by this number.

E.g. $\frac{5}{\sqrt{2}} = \frac{5}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{5\sqrt{2}}{2}$

If the denominator has two terms, change the sign between them and multiply both the numerator and denominator by this.

E.g. $\frac{7}{2 + \sqrt{3}} = \frac{7}{2 + \sqrt{3}} \times \frac{2 - \sqrt{3}}{2 - \sqrt{3}}$

$\frac{14 - 7\sqrt{3}}{4 - 3} = 14 - 7\sqrt{3}$