

# Rational and Irrational Numbers

A **rational number** is any number that can be written as a **ratio of two numbers** - i.e. as a fraction  $\frac{a}{b}$  where  $a$  and  $b$  are whole numbers (and  $b$  is not zero).

 Examples

$$7 = \frac{7}{1}$$

All integers can be written as a fraction over 1

$$4\frac{4}{5} = \frac{24}{5}$$

Fractions and mixed numbers

$$3.2 = \frac{16}{5}$$

Terminating decimals

$$0.\dot{3} = \frac{1}{3}$$

Recurring decimals

If a number is not rational, we call it **irrational**. In decimal form, irrational numbers are infinitely long with no recurring pattern.

 Examples

$\sqrt{3} = 1.73205\dots$  is a **surd** and is therefore **irrational**.

$\pi$  is also an irrational number.