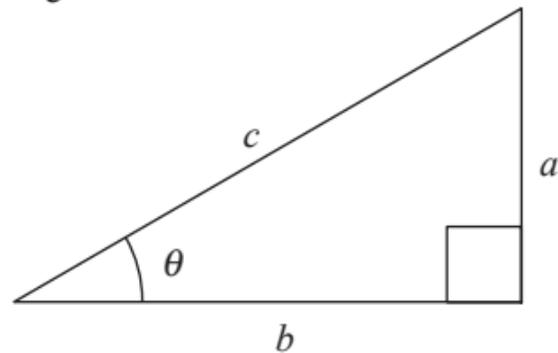


You can use trigonometry to find lengths and angles in right-angled triangles. This branch of mathematics is used in engineering, technology and many sciences.

Pythagoras' theorem for right-angled triangles is  $a^2 + b^2 = c^2$

Dividing by  $c^2$  gives  $\frac{a^2}{c^2} + \frac{b^2}{c^2} = \frac{c^2}{c^2}$  or  $\left(\frac{a}{c}\right)^2 + \left(\frac{b}{c}\right)^2 = 1$



$$\sin \theta = \frac{a}{c}$$

$$\cos \theta = \frac{b}{c}$$

$$\tan \theta = \frac{a}{b}$$

See p.300

For a list of mathematical notation.

$$\sin^2 \theta + \cos^2 \theta \equiv 1$$

**Key point**

$$\tan \theta = \frac{a}{b}$$

Dividing numerator and denominator of  $\tan \theta$  by  $c$  gives a definition for  $\tan \theta$  in terms of  $\sin \theta$  and  $\cos \theta$

$$\tan \theta \equiv \frac{\frac{a}{c}}{\frac{b}{c}} \equiv \frac{\sin \theta}{\cos \theta}$$

**Key point**

These two identities are true for all values of  $\theta$