

# Double angle formula

A *double angle formula* is a trigonometric identity which expresses a trigonometric function of  $2\theta$  in terms of trigonometric functions of  $\theta$ . They are special cases of the compound angle formulae. The main formulae are:

$$\begin{aligned}\cos 2\theta &= \cos^2 \theta - \sin^2 \theta \\ &= 2\cos^2 \theta - 1 \\ &= 1 - 2\sin^2 \theta\end{aligned}$$

$$\sin 2\theta = 2\sin \theta \cos \theta$$

$$\tan 2\theta = \frac{2\tan \theta}{1 - \tan^2 \theta}$$

There are corresponding formulae for the hyperbolic functions, which can be obtained by applying [Osborn's rule](#) to these formulae.