

Double and Half Angles

D $\sin 2u = 2 \sin u \cos u$

O $\cos 2u = \cos^2 u - \sin^2 u$
 $= 2\cos^2 u - 1$
U $= 1 - 2\sin^2 u$

B $\tan 2u = \frac{2 \tan u}{1 - \tan^2 u} = \frac{\sin 2u}{\cos 2u}$

L

E

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H

$$\sin \frac{u}{2} = \pm \sqrt{\frac{1 - \cos u}{2}}$$

A

$$\cos \frac{u}{2} = \pm \sqrt{\frac{1 + \cos u}{2}}$$

L

F

$$\tan \frac{u}{2} = \frac{1 - \cos u}{\sin u} = \frac{\sin u}{1 + \cos u}$$