

Small Angle Approximation

The following formulae are reasonably accurate when θ is small.

$$\sin \theta \approx \theta \quad (1)$$

$$\cos \theta \approx 1 - \frac{\theta^2}{2} \quad (2)$$

$$\tan \theta \approx \theta \quad (3)$$

The following equation is also often used for further simplification.

$$\theta^2 \approx 0 \quad (4)$$

This leads to

$$\cos \theta \approx 1 \quad (5)$$