



T , the Period: time for one complete cycle or revolution.

$$X(t) = X(t+T)$$

$$X_m \cos(\omega t + \phi) = X_m \cos(\omega[t+T] + \phi)$$

$$\cos(\omega t + \phi) = \cos(\omega t + \phi + \omega T)$$

but $\cos(\phi) = \cos(\phi + 2\pi)$, $\therefore \omega T = 2\pi$

or $\omega = \frac{2\pi}{T}$

Trig 101
 $y = A \cos Bx$, $T = \frac{2\pi}{B}$

The frequency f : $f = \frac{1}{T}$, # of cycles per second.

$$f = \frac{1}{\frac{2\pi}{\omega}} = \frac{\omega}{2\pi} \quad \text{or} \quad \omega = 2\pi f$$

Ex:  Bug makes 2 Rev in 1 sec.

$$T = ?$$

$$f = ? \text{ units?}$$

$$\omega = ?$$