

Simple Harmonic Motion:

$$x(t) = [A]\cos(\omega t)$$

$$x(t) = [A]\sin(\omega t)$$

$$v(t) = -[A\omega]\sin(\omega t) \quad \text{OR}$$

$$v(t) = [A\omega]\cos(\omega t)$$

$$a(t) = -[A\omega^2]\cos(\omega t)$$

$$a(t) = -[A\omega^2]\sin(\omega t)$$

$$x_{\max} = A$$

Period = T (seconds per cycle)

$$v_{\max} = A\omega$$

Frequency = $f = 1/T$ (cycles per second)

$$a_{\max} = A\omega^2$$

Angular frequency = $\omega = 2\pi f = 2\pi/T$

For spring: $\omega^2 = k/m$