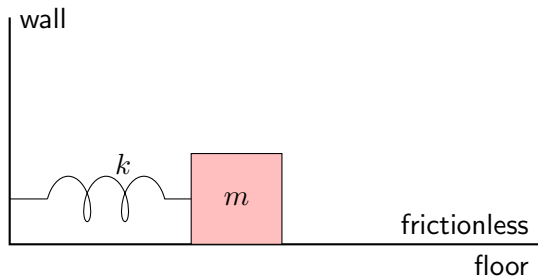


Oscillation

Scott N. Walck

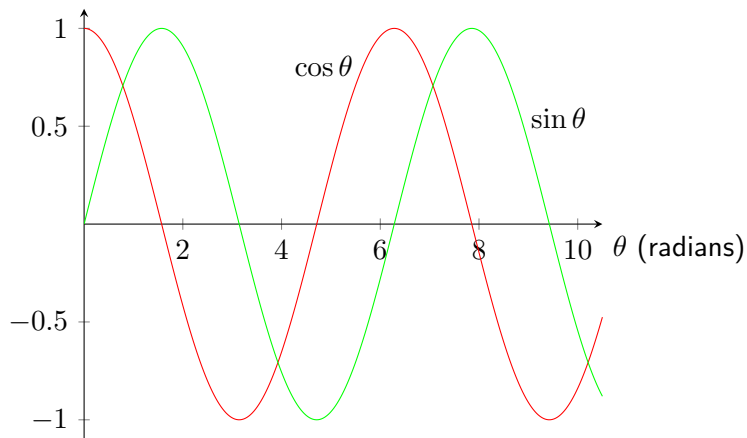
November 28, 2022

Mass on a Spring

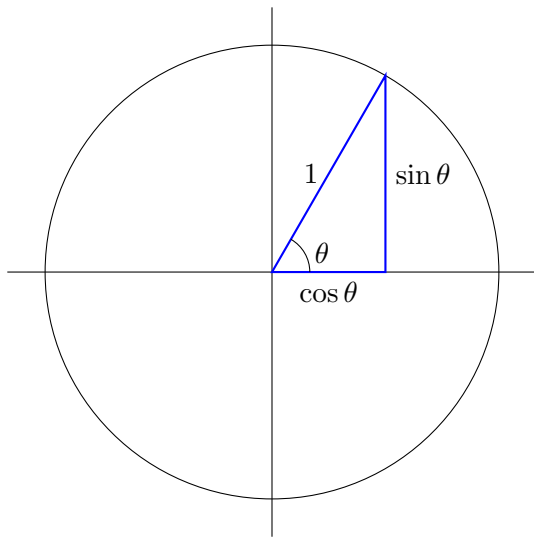


$$\omega = \sqrt{\frac{k}{m}}$$

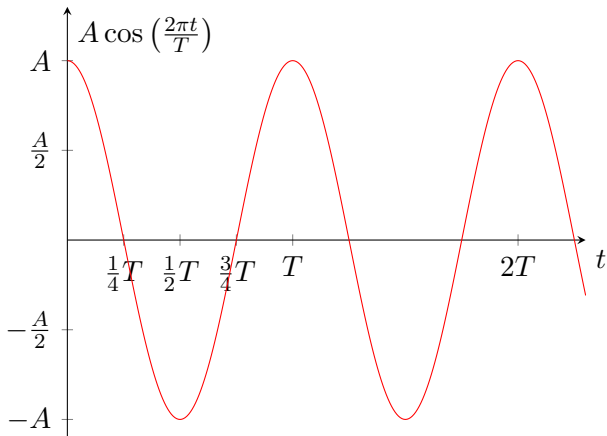
The Cosine and Sine Functions



Connection between Rotation and Oscillation



An oscillation has an amplitude and a period.



► A is amplitude, T is period

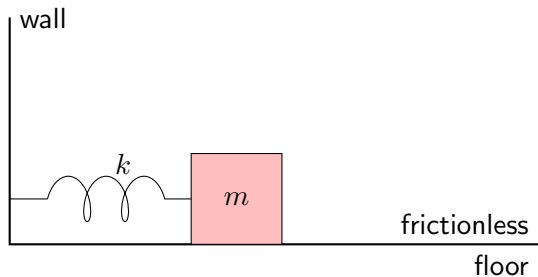
Period, frequency, and angular frequency are all talking about the same thing.

Quantity	Symbol	Unit
Period	T	s
Frequency	f	Hz = cycle/s = rev/s
Angular frequency	ω	rad/s

$$f = \frac{1}{T}$$

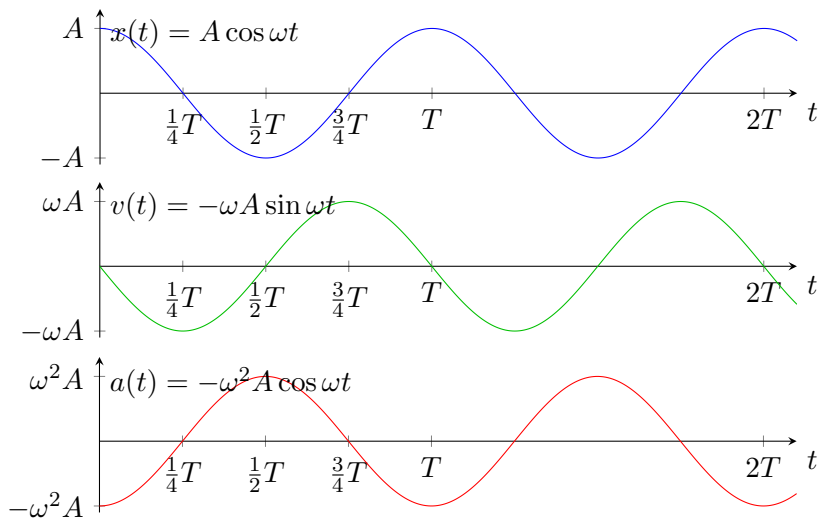
$$\omega = 2\pi f$$

Mass on a Spring



$$\omega = \sqrt{\frac{k}{m}}$$

Position, Velocity, and Acceleration for a Mass on a Spring



Pendulum

$$\omega = \sqrt{\frac{g}{\ell}}$$