Exam 1 Equations

$f' = f\frac{v \pm v_o}{v \pm v_s}$, + observer moving towards, - observer moving away, - source moving towards, + source moving away.

$v = 331 \text{ m/s} \sqrt{1 + \frac{T}{273}}$ $I = \frac{P}{4\pi r^2}$ $\beta = 10 \log (\frac{I}{I_o})$ $I_o = 1 \times 10^{-12} \text{ W/m}^2$

$F = -kx$ $a = -\frac{k}{m} x$ $v = \lambda f$ $T = 1/f$

Period of a Spring: $T = 2\pi\sqrt{\frac{m}{k}}$ *Period of a pendulum:* $T = 2\pi\sqrt{\frac{L}{g}}$ $g = 9.8 \text{ m/s}^2$

$PE_s = ½ kx^2$ $PE_g = mgh$ $KE = ½mv^2$ $v = \pm\sqrt{\frac{k}{m}(A^2 - x^2)}$

Equations of motion general: $x = A \cos(2\pi f t)$ $v = -2\pi f A \sin(2\pi f t)$ $a = -(2\pi f)^2 A \cos(2\pi f t)$

Equations of motion springs: $x = A \cos(\sqrt{\frac{k}{m}}\, t)$ $v = -\sqrt{\frac{k}{m}} A \sin(\sqrt{\frac{k}{m}}\, t)$ $a = -\frac{k}{m} A \cos(\sqrt{\frac{k}{m}}\, t)$