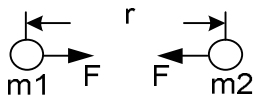
Formula Sheet (1st Midterm)

Formulas	Variables	Variables continued & Constants	Picture (Visualization)
example $F = \frac{Gm_1m_2}{r^2}$	F : gravitational force m_1 : mass 1; m_2 : mass 2 r : separation distance	G : 6.67×10^{-11} Nm^2/kg^2	
$T = 2\pi\sqrt{\frac{m}{k}}$			
$\omega = 2\pi f$			
$f = \frac{1}{T}$			
$v = \lambda f$			
$T = 2\pi\sqrt{\frac{L}{g}}$			
$v = \sqrt{\frac{F}{\mu}}$			
$v = \sqrt{\frac{\gamma kT}{m}}$			
$v = \sqrt{\frac{B_{ad}}{\rho}}$			
$v = \sqrt{\frac{Y}{\rho}}$			
$v = 331\sqrt{\frac{T}{273}}$			
$\Delta s = \lvert\ell_1 - \ell_2\rvert = n\lambda$ $n = 0,1,2,3\ldots$			
$\Delta s = \lvert\ell_1 - \ell_2\rvert = \left(n + \frac{1}{2}\right)\lambda$ $n = 0,1,2,3\ldots$			

$y = A\sin\left(2\pi ft \mp \frac{2\pi x}{\lambda}\right)$			
$I = \frac{P}{A}$			
$f_O = f_S\left(\frac{v \pm v_O}{v \mp v_S}\right)$	for the numerator $\begin{cases} + \text{ toward} \\ - \text{ away} \end{cases}$ & for the denominator; $\begin{cases} - \text{ toward} \\ + \text{ away} \end{cases}$		
$f_{beat} = \lvert f_1 - f_2 \rvert$			
$f_n = n\left(\frac{v}{2L}\right) \quad n = 1,2,3,\ldots$			
$f_n = n\left(\frac{v}{2L}\right) \quad n = 1,2,3,\ldots$			
$f_n = n\left(\frac{v}{4L}\right) \quad n = 1,3,5,\ldots$			
$N = \frac{q}{e}$			
$F = \frac{kq_1q_2}{r^2}$			
$F = q_0E$			
$E = \frac{kq}{r^2}$			
$\Phi_E = EA\cos\theta$			
$E = \frac{q}{\varepsilon_0 A} = \frac{\sigma}{\varepsilon_0}$			

Appendix

$E = Pt$ (Energy–Power relation);

$F = ma$ (Newton's equation of motion)

Surface area of sphere = $4\pi r^2$; Area of circle = πr^2

M (mega) $\times 10^6$; k (kilo) $\times 10^3$; m (milli) $\times 10^{-3}$; μ (micro) $\times 10^{-6}$