Equation Sheet for Exam #4 and Exam #5

	Normal (Axial) Stresses	Torsion in a Circular Shaft	Members in Pure Bending	Horizontal Shear due to Transverse Loads
	_____	_____	_____	_____
Stress	$\sigma = \frac{N}{A}$	$\tau = \frac{T\rho}{J}$	$\sigma_x = -\frac{My}{I}$	$\tau = \frac{VQ}{It}$ Shear Force = $\frac{VQ}{I}\Delta x$
Strain	$\epsilon = \frac{\delta}{L_o}$	$\gamma = \frac{\rho\phi}{L}$	$\epsilon_x = -\frac{y}{\rho}$	
				Pressurized Containers
Hooke's Law	$\sigma = E\,\epsilon$	$\tau = G\,\gamma$	$\sigma_x = E\,\epsilon_x$	$\sigma_x = \frac{Pr}{2t}$ (longitudinal) $\sigma_y = \frac{Pr}{t}$ (hoop)
Deformation	$\delta = \frac{NL}{AE}$	$\phi = \frac{TL}{JG}$	$\frac{1}{\rho} = \frac{M}{EI}$	
	A = Area	J = Area Polar Moment of inertia (= $\frac{\pi}{2}c^4$)	I = Area Moment of inertia w/r neutral surface	Q = $y'A'$
	N = Axial Load	T = Torsional Moment (Torque)	M = Bending Moment	V = Internal Transverse Shear Force
		$P = T\omega$, $\omega = 2\pi f$ and 1 hp = 550 ft lb/s = 746 W	$\frac{dV}{dx} = w$ $V = \int \omega\,dx + V_0$ $\frac{dm}{dx} = V$ $M = \int V\,dx + M_0$	
