Useful Formulas

Relationship	Variables	Equation
Contact Angle on Spherical Surface	h = height of drop d = base diameter of drop θ = contact angle	$\theta = 2 \tan^{-1}(2h / d)$
Young's Force Balance for Sessile Drop	γ_{LV} = liquid-vapor interfacial tension γ_{SV} = solid-vapor interfacial tension γ_{SL} = solid-liquid interfacial tension θ = contact angle	$\gamma_{LV} \cos(\theta) = \gamma_{SV} - \gamma_{SL}$
Young and Laplace Interfacial Pressure across Curved Surface	ΔP = interfacial pressure difference γ = interfacial tension R_1, R_2 = surface's radii of curvature	$\Delta P = \gamma (1/R_1 + 1/R_2)$
Force on Wilhelmy Plate	γ_{LV} = liquid-vapor interfacial tension θ = contact angle F = force L = perimeter of plate	$F = L \gamma_{LV} \cos(\theta)$
Mean of Data Set	n = number of items i = index of item x = value of item μ = mean (average) of set	$\mu = \Sigma x_i / n$
Standard Deviation of Data Set	n = number of items i = index of summed item x = value of item μ = mean (average) of set σ = standard deviation	$\sigma = \sqrt{(1/(n-1) \Sigma (x_i - \mu)^2)}$
Coefficient of Variance of Data Set	μ = mean (average) of set σ = standard deviation COV = coefficient of variance	$COV = \sigma / \mu$
Hook's Law for Stress/Strain	τ = stress, or force per unit area γ = strain, relative change in length G = elastic modulus	$\tau = G \gamma$
Linear Viscoelasticity	$\tau(t)$ = time varying stress γ = strain G(t) = time varying elastic modulus	$\tau(t) = G(t) \gamma$
Elastic Modulus	ω = radian frequency $\tau(t) = \tau_o \sin(\omega t)$ = time varying stress $\gamma(t) = \gamma_o \sin(\omega t + \phi)$ = time varying strain G' = elastic, or in-phase, modulus	$G' = \tau_o \cos(\phi) / \gamma_o$
Viscous Modulus	$\tau(t) = \tau_o \sin(\omega t)$ = time varying stress $\gamma(t) = \gamma_o \sin(\omega t + \phi)$ = time varying strain G'' = viscous, or out-of-phase, modulus	$G'' = \tau_o \sin(\phi) / \gamma_o$
Dynamic Viscosity	ω = radian frequency G'' = viscous, or out-of-phase, modulus η' = dynamic viscosity	$\eta' = G'' / \omega$
Dynamic Elasticity	ω = radian frequency G' = elastic, or in-phase, modulus η'' = dynamic elasticity	$\eta'' = G' / \omega$
Units		1 dyne/cm = 1 mN/m = 1 mJ/m^2