PHYSICS 211 EXAM 1 REFERENCE SHEET

The quadratic formula: if $Ax^2 + Bx + C = 0$, then

$$x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

Constant-acceleration distance and velocity relations (one dimension):

$$s(t) = \frac{1}{2}at^2 + v_0 t + s_0$$
$$v(t) = at + v_0$$

where the constant acceleration is a, the initial velocity is v_0, the initial position is s_0, and the time elapsed is t.

Their rotational equivalents are:

$$\theta(t) = \frac{1}{2}\alpha t^2 + \omega_0 t + \theta_0$$
$$\omega(t) = \alpha t + \omega_0$$

where the angle is θ, the angular velocity is ω, and the angular acceleration is α.

The "third kinematics equation" and its angular equivalent:

$$v_f^2 - v_0^2 = 2a(\Delta x)$$
$$\theta_f^2 - \theta_0^2 = 2\alpha(\Delta\theta)$$

Angle can be measured three ways:

1 complete rotation $= 2\pi$ radians $= 360$ degrees.