Here's a linear world to rotational world "dictionary." Please note that it is not 100% accurate (like all translations). For example, while it is true that for a spinning object $\mathbf{L} = I\omega$ the *most general* expression for angular momentum is $\mathbf{L} = \mathbf{r} \times \mathbf{p}$. Note also that rotational kinetic energy is $KE_{rot} =$

$x \rightarrow \theta$
$v \rightarrow \omega$
$a \rightarrow \alpha$
$m \rightarrow I$

Table 1: Linear to Rotational "Dictionary"

$\frac{1}{2}I\omega^2$. Also, recall we have: Note that κ depends on the object but always

x	$=$	$r\theta$
v	$=$	$r\omega$
a	$=$	$r\alpha$
$\kappa m r^2$	$=$	I

Table 2: The radius, r, is like our Rosetta stone!

takes values between zero and one.

Here's an example. We have:

$$x_f = x_i + v_i t + \frac{1}{2} a t^2 \tag{1}$$

and we want to know the corresponding equation in the rotational world. Well, using our dictionary it is:

$$\theta_f = \theta_i + \omega_i t + \frac{1}{2} \alpha t^2 \tag{2}$$