USING THE LAW OF CONSERVATION OF TOTAL MECHANICAL ENERGY WITH:

$$KE = \frac{1}{2} M \dot{x}^2 + \frac{1}{2} I \left(\frac{\dot{x}}{R}\right)^2$$

$$PE = Mg x \sin \phi$$

WE HAVE

$$\frac{1}{2} M \dot{x}^2 + \frac{1}{2} I \left(\frac{\dot{x}}{R}\right)^2 = Mg x \sin \phi$$

HOW CAN I MAKE THIS INTO AN <u>EQUATION OF MOTION</u> THAT ENABLES ME TO FIND THE ACCELERATION ($\ddot{x}$) BY DIFFERENTIATING IT. SO THAT

$$\ddot{x} = \frac{g \sin \phi}{1 + I/(MR^2)}$$

I WOULD APPRECIATE AN ANSWER TO THIS PROBLEM AS SOON AS POSSIBLE, SO IF YOU CANNOT START ANSWERING STRAIGHT AWAY PLEASE DO NOT SIGN-OUT.

THANK YOU VERY MUCH.