Particle F=ma (n-t):  Example Problem 4

I call this a “tetherball” problem. You see carnival rides that work like this, too. A ball, constrained by a cable, swings in a circle (in a horizontal plane) with a constant speed $v$. Write an equation that relates $v$, $r$, $L$, and the angle, $\theta$, and discuss the result.

Find the angle, $\theta$, for the given $v$. mass = $m$

mass = $m$

tetherball

$\theta$

$L$

$v$

$r$
Kinds of problems:

1. Easy: Given $\theta$ and L or r, find the corresponding speed, $v$:

2. Harder: Given $v$ and L or r, find the corresponding $\theta$: