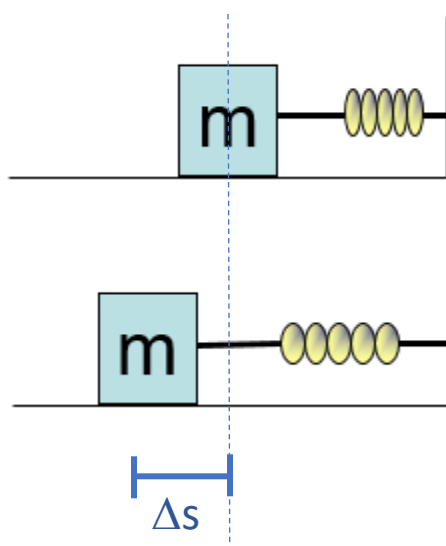
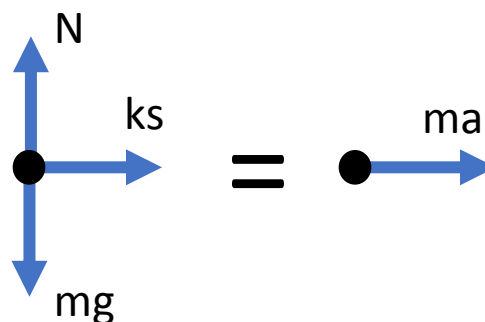




When we pull the the mass to the left and then let go, the FBD of the mass looks like:



Look at just the horizontal dimension we come with an equation $ks = -ma$ which can be rewritten as:

$$a = -\frac{k}{m}s$$

In Ph 211 we would have integrated this acceleration twice to get a position equation. But, in this equation we already have position on the right-hand side of the equation and we can't integrate a position function because the integral of a position function is nothing physical.

Thus, to find the position, velocity and acceleration functions we need to “guess” a solution and then “check” to see if our guess is any good.

Guess that the position equation is:

$$s(t) = A\cos(\omega t)$$

Now, here, check to see if this guess works: