Co-ordinate 'x' is defined positive in the downward direction.
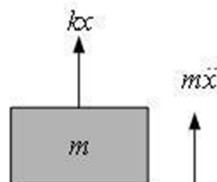Let A be the amplitude of the vibration.
+A : maximum deflection in the positive(downward) x direction.

Let say, mass is at certain position x somewhere between x = 0 and x = +A as it moves AWAY from equilibrium, if we draw the Free Body Diagram: we have a restoring force (spring force F = k x) and inertia force ' $m\ddot{x}$ '.

If we use D'Alembert's Law: the equation of motion becomes :

$$- m\ddot{x} - kx = 0$$



Inertia force always acts opposite to the direction of the motion so it's negetive of $m\ddot{x}$.
Spring force is acting in the negetive x direction. Hence, - kx.
Let say, now the mass is at certain position x somewhere between x = 0 and x = +A as it moves TOWARDS the equilibrium, how do we write the equation of motion in this case?

Spring force is : -kx
Inertia force is: + $m\ddot{x}$ (opposite to the direction of motion – motion is upwards)

Equation of motion : $m\ddot{x}$ – kx = 0
It is supposed to be same as the previous equation. Where am I going wrong?