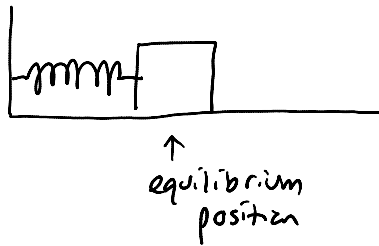


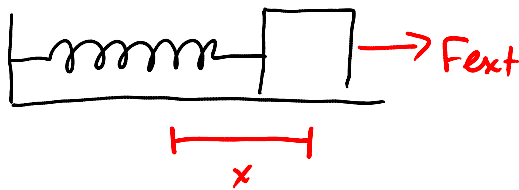
Section 31.10: Applications of Higher-order Equations

Tuesday, April 23, 2013
12:02 PM

Hooke's Law:



considering mass on a frictionless surface with an ideal spring



pull spring to the right by F_{ext} (a constant force)

- spring pulls back, stretches until

$$\vec{F}_{spring} = - \vec{F}_{ext}$$

but Hooke's law says

$$\vec{F}_{spring} = -k\vec{x}$$

↑
if you stretch spring to right, force is to the left (opposite direction to the displacement)

now let go of the block so $F_{ext} = 0$

what happens? ↙ unbalanced!

block has force pulling it to the left, so block accelerates

$$\sum \vec{F} = m\vec{a}$$

$$-kx = m \frac{d^2x}{dt^2}$$

← 2nd order
linear
DE