

Sample test question (from Fletch's textbook)

9.25) A 3 kg block is attached to a vertical spring. The spring and mass are allowed to gently elongate until they reach equilibrium a distance .7 meters below their initial position. Once at equilibrium, the system is displaced an additional .4 meters. A stopwatch is then used to track the position of the mass as a function of time. The clock is started when the mass is at $y = -.15$ meters (relative to equilibrium) moving *away from* equilibrium. Knowing all this, what is:

- a.) The *spring constant*?
- b.) The oscillation's *angular frequency*?
- c.) The oscillation's *amplitude*?

- d.) The oscillation's *frequency*?
- e.) The *period*?
- f.) The *energy* of the system?
- g.) The *maximum velocity* of the mass?
- h.) The *position* when at the maximum velocity?
- i.) The *maximum acceleration* of the mass?
- j.) The *position* when at the maximum acceleration?
- k.) A general *algebraic expression* for the position of the mass as a function of time?