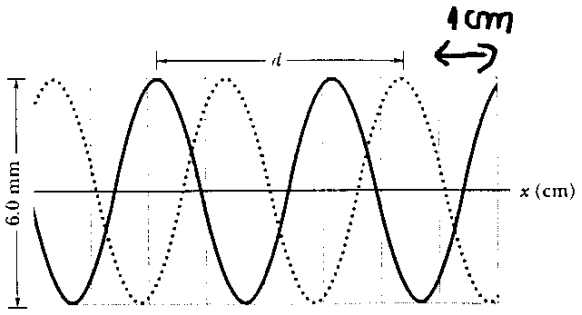
Figure of Problem2

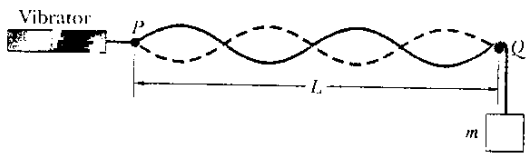


Problem 3 [*10 points*]

In figure 3, a string, tied to a vibrator at P and running over a support at Q, is stretched by a block of mass m. The separation L between P and Q is 1.2 m, the linear density of the string is 1.6 g/m, and the frequency f of the vibrator is fixed at 120 Hz. The amplitude of the motion at P is small enough for that point to be considered a node. A node also exists at Q.

(a) What mass m allows the vibrator to set up the fourth harmonic on the string?

(b) What standing wave mode is set up if $m = 1.00$ kg.



Problem4

(a) Sketch the profile of the wave $y(x,t) = A\ e^{-B(x-vt)^2}$ at $t = 0$s and $t = 1$s, using $A = 1.0$ m, $B = 1.0\ m^{-2}$ and $v = 2.0$ m/s.

(b) Verify by partial differentiation, that the wave function of part (a) satisfies the one-dimensional wave equation.