Initial Energy = Final Energy 
$$U_g = U_F + U_S$$

$$mgh = F_F I + \frac{1}{2}kx^2$$

$$L = d + x$$

$$h = sin(t)f$$

$$F_F = m g cos(t)f$$

$$M g sin(t) (d+x) = m g cos(t)f(d + x) + \frac{1}{2}kx^2$$

$$\frac{1}{2}kx^2 + mg(d+x)(cos(t)f-sin(t)) = 0$$

$$\frac{1}{2}kx^2 + mg(cos(t)f-sin(t)) = 0$$

$$a = \frac{1}{2} kx^{2}$$

$$b = mg(cos(t)f-sin(t))$$

$$c = dmg(cos(t)f-sin(t))$$

$$x = (-b + sqrt(b^2 - 4ac))/(2a)$$