16.6 For the spring-mass system shown in Figure P16–6, determine the mass displacement, velocity, and acceleration for five time steps using (a) the central difference method, (b) Newmark's time integration method, and (c) Wilson's method. Let $k = 1200$ lb/ft and $m = 2$ slugs.
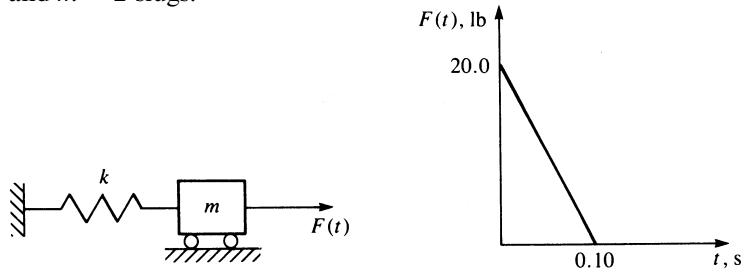

Figure P16–6

16.7 For the bar shown in Figure P16–7, determine the nodal displacements, velocities, and accelerations for five time steps using two finite elements. Let $E = 30 \times 10^6$ psi, $\rho = 0.00073$ lb-s^2/in^4, $A = 1$ in^2, and $L = 100$ in.
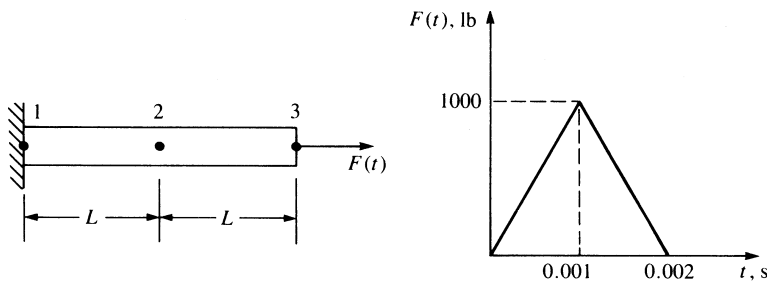

Figure P16–7

16.8 For the bar shown in Figure P16–8, determine the nodal displacements, velocities, and accelerations for five time steps using two finite elements. For simplicity of calculations, let $E = 1 \times 10^6$ psi, $\rho = 1$ lb-s^2/in^4, $A = 1$ in^2, and $L = 100$ in. Use Newmark's method and Wilson's method.
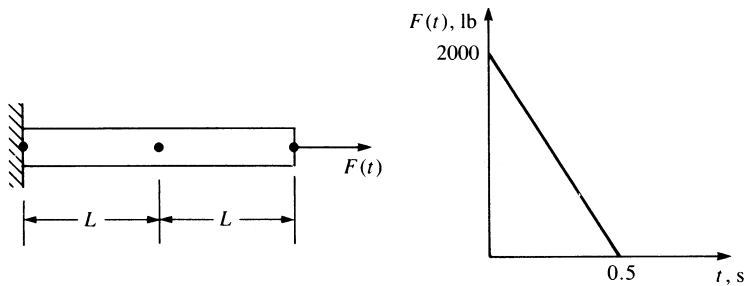

Figure P16–8