

58. We make the unconventional choice of *clockwise* sense as positive, so that the angular velocities in this problem are positive. With  $r = 0.60$  m and  $I_0 = 0.12$  kg  $\cdot$  m<sup>2</sup>, the rotational inertia of the putty-rod system (after the collision) is  $I = I_0 + (0.20)r^2 = 0.19$  kg  $\cdot$  m<sup>2</sup>. Invoking angular momentum conservation, with SI units understood, we have

$$\begin{aligned} L_0 &= L_f \\ I_0\omega_0 &= I\omega \\ (0.12)(2.4) &= (0.19)\omega \end{aligned}$$

which yields  $\omega = 1.5$  rad/s.