93. We choose positive coordinate directions so that each is accelerating positively, which will allow us to set $a_{\text{box}} = R\alpha$ (for simplicity, we denote this as a). Thus, we choose downhill positive for the $m = 2.0$ kg box and (as is conventional) counterclockwise for positive sense of wheel rotation. Applying Newton's second law to the box and (in the form of Eq. 11-37) to the wheel, respectively, we arrive at the following two equations (using θ as the incline angle 20°, not as the angular displacement of the wheel).

$$\begin{aligned} mg\sin\theta - T &= ma \\ TR &= I\alpha \end{aligned}$$

Since the problem gives $a = 2.0$ m/s^2, the first equation gives the tension $T = m(g\sin\theta - a) = 2.7$ N. Plugging this and $R = 0.20$ m into the second equation (along with the fact that $\alpha = a/R$) we find the rotational inertia $I = TR^2/a = 0.054\,\text{kg}\cdot\text{m}^2$.