HW 9-13 Soln)

We’ll use conservation of angular momentum. As seen for the center of the merry-go-round, Jimmy’s angular momentum is Rmv at the instant he jumps on. We’ll assume that the merry-go-round is initially at rest. They then have the same final angular momentum. So,

$$L\_{TOTAL i}=L\_{TOTAL f}$$

$$Rm\_{J}v\_{J i}+0=(I\_{MGR}+I\_{J})ω\_{f}$$

We’ll treat Jimmy as a point mass and the platform as a disk.

$$ω\_{f}=\frac{Rm\_{J}v\_{J i}}{I\_{MGR}+I\_{J}}=\frac{Rm\_{J}v\_{J i}}{\frac{1}{2}m\_{NGR}R^{2}+m\_{J}R^{2}}= \frac{2\left(30\right)2}{\frac{1}{2}100(2)^{2}+30(2)^{2}}=0.38 rad/s$$