

3. The free-body diagram for the player is shown below.  $\vec{N}$  is the normal force of the ground on the player,  $m\vec{g}$  is the force of gravity, and  $\vec{f}$  is the force of friction. The force of friction is related to the normal force by  $f = \mu_k N$ . We use Newton's second law applied to the vertical axis to find the normal force. The vertical component of the acceleration is zero, so we obtain  $N - mg = 0$ ; thus,  $N = mg$ . Consequently,

$$\begin{aligned}\mu_k &= \frac{f}{N} \\ &= \frac{470 \text{ N}}{(79 \text{ kg}) (9.8 \text{ m/s}^2)} \\ &= 0.61 .\end{aligned}$$

