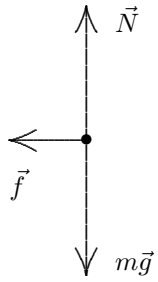
7. The free-body diagram for the puck is shown below. $\vec{N}$ is the normal force of the ice on the puck, $\vec{f}$ is the force of friction (in the $-x$ direction), and $m\vec{g}$ is the force of gravity.

(a) The horizontal component of Newton's second law gives $-f = ma$, and constant acceleration kinematics (Table 2-1) can be used to find the acceleration.

Since the final velocity is zero, $v^2 = v_0^2 + 2ax$ leads to $a = -v_0^2/2x$. This is substituted into the Newton's law equation to obtain

$$\begin{aligned} f &= \frac{mv_0^2}{2x} \\ &= \frac{(0.110\,\text{kg})(6.0\,\text{m/s})^2}{2(15\,\text{m})} \\ &= 0.13\ \text{N} \ . \end{aligned}$$



(b) The vertical component of Newton's second law gives $N - mg = 0$, so $N = mg$ which implies (using Eq. 6-2) $f = \mu_k mg$. We solve for the coefficient:

$$\mu_k = \frac{f}{mg} = \frac{0.13\,\text{N}}{(0.110\,\text{kg})\left(9.8\,\text{m/s}^2\right)} = 0.12 \ .$$