# 1 Class Handout - Newton's Laws

1. A $10kg$ object is pushed with a force of $30N$ across a frictionless floor. Draw a diagram of the object, labeling all the forces acting on it. Find the acceleration of the object.

2. A hocky puck ($.3kg$) moves across the ice rink in a straight line at constant speed. What is the net force acting on the puck?

3. A $5kg$ object falls from rest from a height of $125m$. During its fall, a horizontal wind exerts a force on it of $10N$. How far will the object move horizontally by the time it hits the ground?

4. Two ice skaters, a man (weighing $800N$) and a woman (weighing $500N$), are stationary when the man pushes the woman with a force of $200N$ for a duration of $1s$. During the push, what is the accelaration of eachperson? Assume the surface of ice to be frictionless and $g = 10\frac{m}{s^2}$.

- After the push, what is their accelerations then?

- Also, after the push, what are their velocities?

5. For an object laying on the ground, to the normal force and gravitational force form an action-reaction pair?

6. Consider a $7kg$ mass hanging at rest from a wire. What is the tension in the wire?

- If instead, the mass hanging from the wire was accelerating down at $2\frac{m}{s^2}$ (such as by you lowering it), what would be the tension in the wire?

- If instead, the mass hanging from the wire was accelerating up at $3\frac{m}{s^2}$ (such as by you lifting it), what would be the tension in the wire?