So we start with problem number 1, which is 2.A.4. It deals with spring gun and pucks on a frictionless horizontal table. And all this comes down to Newton's first law, F equals ma. And so I'll write that in glorious detail, one of the key equations of 801. F equals ma. It's a vector equation. a, the acceleration is in the same direction at any moment in time that the force acts. F in terms of magnitude, we express in terms of Newtons. m, which is a scalar in kilograms. And a, which is a vector, the magnitude of that is meters per second squared.

If we take an example, if the magnitude of F-- and I'll put vertical bars here to indicate that we're dealing with a magnitude-- is 5 Newtons, if the mass were 2 kilograms, then the magnitude of the acceleration were 2 and 1/2 meters per second squared.

If there is no force, if the net force is 0, then the net acceleration is 0. If the net force is not 0, the net acceleration is not 0.

Now, be careful. If the net force is 0, it does not mean necessarily-- it doesn't mean at all in general that the object isn't moving. No acceleration simply means that the velocity is a constant. It doesn't change in magnitude and it doesn't change in direction. So don't make the mistake that you think if that force is 0 and therefore, the acceleration, that the object necessarily has to stand still. That is not at all true.