Ch 6 #8

Just be careful to read the problem as you're doing a force diagram to start. It says that the man is pushing just hard enough to keep the piano from accelerating as it (and he) slides down the incline at a constant speed.

Ch 6 #19

When you look at the quantities you've been given, you might be tempted to use F=ma along with kinematics, which would work. But try to do it with our new ideas instead. The formula $W_{net}=\Delta KE$ should match up nicely with what you've been given to allow you to solve for final speed.

Ch 6 #39

Make sure you really consider all forms of energy involved. Since the spring is oriented vertically, when it is released to launch the ball, it not only gives the ball KE, but also gives it some PE. So for part A when it reaches its launch point, the ball has gained a little bit of PE and a lot of KE.

For part B, it's easiest just to start the problem over and think of the initial situation as back when the spring was compressed.

Ch 6 #40

Start by considering the block at the top of the loop. You want to consider the *slowest* possible speed the block could be moving and stay on the track, so set up a centripetal force 2nd law equation, but with $F_N=0$ since the block is almost falling off of the track. Solve this equation for v (in terms of other variables).

Now set up an E-conservation equation, where the easiest way to think about it is straight from the initial situation to this top-of-loop situation, without calculating anything else in between. If you write all distances in terms of r, you should get the right solution.

Ch 6 #41

Feel free to look at this one, but you can really just skip it. I'm not assigning it next year, because I've realized the wording is a little too weird.