How to hack physics problems
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1. Identification: Do I understand what kind of problem this is (kinematic, force, energy, etc.)?

Examine the wording – is this a question about initial and final states in which you can apply some kind of conservation law (energy or momentum) or use the work-energy theorem if there are non-conservative forces (friction), or does it ask about a state of equilibrium (total force and total torque are zero), or does it ask something about the time evolution in which case you need to consider the acceleration and solve the equations of motion starting from Newton's 2nd law?

2. Organization: Have I drawn a picture/diagram of the problem and made a list of all the relevant information with the knowns and unknowns explicitly identified?

Pay attention to hidden information or assumptions – perhaps it is implied that something moves on a circular orbit, or that it is in free-fall, or that the initial or final velocity is zero. Be sure to add any of this hidden information to your list of known quantities.

3. Translation: Have I translated all of the problem statements into a set of equations?

Every statement of relevance should be able to be expressed as a mathematical equation. For example, if a problem states that there is a rope of fixed length, then you can write L_{rope} = constant, so that even if you don't know the specific length you do know that it doesn't change and therefore can be treated as a constant in your equations. In contrast, if a problem states that a rope is stretchable, then we have to think about how to interpret that. We might, for example, write $L_{rope} = L_0 + \Delta L$, where L_0 is the rope of the length without any tension applied to it, and we can model the stretchable rope as a spring with spring constant k using Hooke's Law to give $\Delta L = T/k$, where T is the tension applied to it.

4. Formulation: Have I studied the set of equations and made a plan for solving for the desired unknown quantity/quantities?

In most physics problems you will have more than one unknown and you cannot immediately jump to a solution for your desired quantity. One strategy for solving problems is to write out all equations that are possibly useful and then circle all the unknowns in your equations. Next, develop a systematic plan for solving for your desired unknown. Remember - there are many paths through the algebra to the final answer. Knowing which path is most efficient is largely a matter of experience, so give it try.

5. Reflection: Does the answer I found make sense in the context of the problem and compared to what I believe to be true about the world more generally?

If an answer doesn't make sense then your first assumption should be that there is a math error and you should diligently **check your work and your assumptions**. For example, if you calculate the recoil speed of the Earth when you jump, you should get a small answer. If you get a large number that must indicate that you made a math error. If after checking your work you believe your answer to be mathematically correct, this may indicate that your understanding of the world needs to be updated.