

## Problem Solving Process

Process Step	Purpose	Value if Present	Value if Absent
Label the problem with chapter and problem number	This is essential if I am to figure out what problem to grade	0	0 to -25
<b>Restate the problem in your own words.</b> One line may do! List any assumptions you are making. You may wish to classify the problem in your problem statement	Most major mistakes come from misinterpreting the problem. This step asks you to slow down and determine what the problem really is asking	1	-1
<b>Identify the type of problem.</b> Pick a strategy, is it a Newton's Second Law problem? Is it a rotational problem with constant rotational acceleration?	By identifying the type of problem it is, you are more likely to be able to find the right equations to get started and to successfully complete the problem. The idea is to pause and see what approach will likely be involved in forming the solution. This is not as hard as it sounds. If the word "force" appears, you can reasonably assume Newton's Second Law will be involved, for example.	2	-2
<b>Draw a picture,</b> label items, define coordinate systems, etc. <i>This picture should be a visual restatement of the problem. View this as a graphical restatement of the problem.</i>	Many mistakes happen because we do not have a clear picture of the problem. This step may save hours of grief. Also, many physics problems will have different symbolic answers because of the freedom to choose coordinate systems, etc. Drawing a diagram gives the reader the ability to understand your vision of the problem.	5	-5
<b>Define variables</b> used, Identify known and unknown quantities	Choose reasonable names for physical quantities, and let me know what they are. Don't forget to include units.	2	-2
<b>List basic equations</b> that apply to the problem	This step gives you a firm starting place.	2	-2
<b>Solve the problem algebraically</b> starting from the basic equations,	This is the heart of the solution. The symbolic answer tells you the relationships between physical quantities.	10	-10
<b>Determine numerical answer</b>	The specific numerical answer is not the point of doing the problem in this class, but is a great indicator that you have succeeded in understanding the physics.	1	-1
<b>Check units.</b> If you have not done the algebra on the units earlier, do it here.	Many mistakes are evident in a units analysis. It is a good habit to always check units.	1	-1
<b>Determine if the numerical answer is reasonable.</b> Indicate if you are comfortable with the result, if you have little experience with the result and can't tell if it is reasonable, or if it is not reasonable, but you don't know why (or else you would fix it).	From your understanding of the physics, state whether the answer is reasonable. For example, if you are calculating the mass of a ping pong ball, and get an answer that is many times the mass of the earth, you should note that there may be a problem even if you do not know where you went wrong.	1	-1 to -25
<b>Total Possible</b>		<b>25</b>	