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For this course the homework is your primary opportunity to engage in peer-to-peer collaborative learning. Education research shows that this can be more effective than student-tutor or even student-professor interactions. For that reason, I have opened this discussion forum.

I do want to say a bit about the "right way" to do homework.

There are two major pitfalls for students who are solving physics problems:

"Formula shopping"- You read the problem, make a list of what you know and what you don't know, then search for a formula that connects the two. Unfortunately, nowhere in this process have you thought about the 'physical principles' involved and how they are applied to the problem.

"Problem solving by analogy"- You read the problem and then begin a search for a similar problem that has a posted solution. Having found one, you force-fit your numbers into that solution. Again, nowhere in the process are you considering the 'physics' of your solution. Don't misunderstand. EXPERTS frequently use analogies to short-cut problem solutions, and this is good. Experts already know the concepts that are being applied and are skilled at recognizing valid analogies. BUT this is your first time in physics. Most of you are not experts.

After A LOT of time slugging away, these two 'problem solving strategies' will eventually get you a good homework score. Unfortunately, they do little to improve your understanding of the physics. For that reason, they are of no help in improving exam scores.

So how should you approach a homework problem? Read the problem. Identify what physical idea from class might apply to the problem (e.g. this is a force problem so maybe we can use

Newton's 2nd Law). Attempt to apply the physical idea to the problem. Look back to your class notes & talk to classmates if you are unsure how to apply the idea. Work the idea until it starts to spit out answers. Then look back at the problem to see if the answers you are getting are related to a question that is asked. **The struggle in this process is what will develop your understanding of the physics!** If class notes & friends still leave you stuck, turn to your reference material (the textbook) and read more about the idea that you are trying to apply. Having tried that, if you are still stuck, then & only then might you consider searching for an analogy.

Whatever process you use, the focus of the process should be on understanding the physical principle and how it is applied to different situations. That develops your understanding. If your process is focused on getting an answer, you will eventually get an answer but you will probably not achieve the 'understanding'.

For what it's worth - just some thoughts based on what I have read in the education research, memory of my own experience as a student, and my years of trying to help students learn physics...