

Metacognitive Reflection prompts for Relativity Chapter 3 – Relativistic Momentum and Energy

Due: Saturday evening February 16. *I encourage you to type up your responses first and save that document, and then copy and paste your response in the appropriate place in the MasteringPhysics assignment.*

Consider your work on the Problems in Relativity Chapter 3. Think about your individual work and, if relevant, your group work, and what you learned by working through these questions. Compare your work to the provided solution set (which you can find at the program web-site, under Assignments: Physics, and scroll down to Week 6).

Your responses should clearly:

- indicate engagement with some or all of the Prompts below
- indicate engagement with the provided Solutions

Standard Prompts

You need not answer all the standard prompts for all (or any) of the questions, but you might consider them all as you reflect on your learning this past week.

- What questions did you have about the set of concepts/skills in this set of problems that have been answered through your practice?
- What questions do you still have about this set of concepts/skills?

Problems 2, 3, 4, 5, 9, 10

*Learning Goal #2 in Relativity 3 is “Given any two of a particle’s dynamical quantities (p , E , u , K , and m) determine any of the others.” Based on your practice in this problem set, how do you judge your skills with this Learning Goal?

*What mathematical mistakes did you make, did you see other students make, or might you or another student make in a quiz situation? What kinds of things should you pay attention to/what kind of advice would you give in order to help minimize these mathematical errors?

*In what ways (if any) did your habits regarding units change as you practiced with these equations in these problems?

*What, if anything, did you learn when looking at the solutions?

Problem 6

*What physics principles did you need to use for this problem? How did you know to use these principles to go from your knowns to your unknowns? Be specific if you can: what words or phrases or clues in the problem statement directed you (or might have directed you) to the appropriate physics principles?

*What, if anything, did you learn when looking at the solutions?

Problems 7 – 8

*What physics principles did you need to use for these problems? How did you know to use these principles to go from your knowns to your unknowns? Be specific if you can: what words or phrases or clues in the problem statement directed you (or might have directed you) to the appropriate physics principles?

*The solutions describe two orders that could be used in Problem 8. Which of these orders did you use? Or did you use a different order? Comparing the two (or more) approaches, which do you prefer? Why?

*What, if anything, did you learn when looking at the solutions?

Problems 11 – 13

*Some people really like these kinds of problems. Others really do not. Which kind are you? Do you know why?

*There was lots you might have learned in working through these questions, so I leave it open-ended what learning you would like to reflect on.

*What, if anything, did you learn when looking at the solutions?

Problem 1

*This problem was similar to Example 1, and also similar to a problem we discussed in lecture. What physics principles did you need to use in these problems? What problem solving-strategies did you need to use?

*What was the main idea of these problems? What purpose did they serve?

*I noticed that many students struggled with this: there were multiple comments in the Reading Response, lots of confusion during our lecture discussion, and similar difficulties during problem session. If you had trouble, or worked with someone who did, what were they? Can you offer suggestions for how to modify the reading assignment or my lecture presentation to address these difficulties?

*What, if anything, did you learn when looking at the solutions?

Personal Response

*What did you find most interesting/intriguing in this chapter, both in the concepts covered and the problems you solved?

*What did you find most challenging in this chapter, both in the concepts covered and the problems you solved?