

This assignment is in two parts. The first part is due at the start of class on Day 6. It will not be collected, but you are expected to complete these exercises, just to practice basic skills. If you feel that you need more practice, then do more problems or talk to me.

13.1 Exercises 8, 9, 16, 17.

13.2 Exercises 5, 6, 10, 11, 15, 20, 25-26, 40, 45, 47.

The second part is due on paper at the start of class on Day 8. Submit polished solutions, including all necessary work and no unnecessary work, in the order assigned.

A. Differentiate $|\vec{r}(t)|^2$ in two different ways, to derive an expression for $|\vec{r}'|$ in terms of $|\vec{r}'|$ and the cosine of a certain angle. Use this result to give an example where $|\vec{r}'| \neq |\vec{r}'|$.

B. 13.2 Exercise 65. (This idea becomes important later, when we do Lagrange multipliers.)

C. 13.2 Exercise 66. (You don't need to know any physics, to learn this tiny slice of physics.)