MTH 254H: Homework 1

Due: September 8, 2017

1. Send me an e-mail introducing yourself. Let me know if you like to be called something other than your registrar listing, and anything you think I should know about your background.
2. Read Sections 1.1-3 in Marsden and Tromba.
3. Do problems 1.1.6, 1.1.8, 1.1.9, 1.1.16, 1.1.17, 1.1.21, 1.1.22, 1.1.27, 1.1.32, 1.1.33, 1.1.35, 1.2.6, 1.2.9, 1.2.12, 1.2.15, 1.2.23, and 1.2.27 in Marsden and Tromba.
4. Prove that a parallelogram is a rhombus (i.e., all sides have equal length) if and only if the diagonals are perpendicular.
5. Give proofs of the two statements in property (iii) of the dot product on page 20 in your textbook.

Notes on homework prep:

- Your answers should in general contain enough text to allow the reader to follow your logic. In particular, in the set above 1.1.32, 1.1.33, 1.2.23, 1.2.27, and problems 4 and 5 should be written out in full sentences explaining your proof.
- For 1.1.35 and 1.1.36, it may be helpful to read Example 3 in the text.
- For problem 5, it may be helpful to consult the textbook's proof of property (i) from the same list, which will also be discussed in class.
- This is not as long as it looks; several of the problems above are quick.