List of proofs for MAT237 Final Exam - Trefor's Material Only

Here is a list of important proofs which are implicitly or explicitly presented in the textbook. Please read and make sure all of these blocks of proofs are understood. You will be asked to reproduce some of these proofs in the Final. The list has been considerably pared down compared to the list for the first test and midterm.

HOW TO STUDY: As I have discussed in class, my goal is not to have you blindly memorize this list. I want you to understand the proofs on this list. Conveying the correct idea, even with wrong details, will be important for part marks. My suggestion is to first carefully read each theorem. See if you can see the big picture ideas in the proof. Then reread the proof making sure you can verify why every detail is true. Can you see where the assumptions come in, what theorems it relies on and why those are necessary, any little facts it is being unclear about? Then write out a short summary of the big ideas of the proof. This is what you should make sure you understand. On the test, you can reproduce this big structure, and hopefully fill in most of the details. Time permitting, you can go back and try writing out the theorems in full based on your shorter summary of the major structure of the proof. This is, of course, just my suggestion on how to study.

1.2:
- The only proof in this section is 1.4, and it has 4 components: (a) $\Rightarrow$, (a) $\Leftarrow$, (b) $\Rightarrow$, (b) $\Leftarrow$.

1.4:
- Theorem 1.14 has two blocks of arguments: *if* and *only if*.

1.5:
- Proof of 1.16,

1.6:
- Proof of 1.23

1.7:
- proof of 1.28.

2.1:
- proof of 2.5
- proof of 2.7 (useful to draw a sketch of what is going on)

2.2:
- proof of 2.23

2.3:
- proof of 2.26 (The proof is long, but uses many important ideas. If you can fully understand this proof, you will likely understand most of the key ideas from 2.1 and 2.2)

2.4:
- proof of 2.39
- proof of 2.42 (The proof structure here is very similar to 1.30 which I didn't ask for, but it can be nice to read the two theorems right after each other).

2.6:
- Proof of 2.45 (Think of why D makes sense as the "difference of the differences")

2.7:
- Proof of 2.63 (Taylor's Theorem with Lagrange's Remainder)(Can you see how this theorem is a generalization of the proof of MVT1?)
- Proof of 2.77

2.8:
- Proof of 2.81

2.9:
- The discussion on page 103 deriving the Lagrange Method.

2.10:
- Proof of 2.85 (proof in preceding discussion)