

21-131 Assignment 3: due Tuesday September 16

- 3.1.** See the handout “Proofs to Grade” and analyze the proofs there and assign them grades as described. Turn in a written analysis for proofs (b), (d), and (e).
- 3.2.** Problem #5 from the LCR handout.
- 3.3.** Problem #7 from the LCR handout.
- 3.4.** From Apostol, page 43, problem 3 (all parts).
- 3.5.** From Apostol, page 56, problem 5cf.
- 3.6.** From Apostol, page 57, problem 11ad.
- 3.7.** From Velleman, page 153, problem 1: Prove that for every real number x there is a unique real number y such that $x^2y = x - y$.

The following are *recommended* problems from Velleman’s book, to discuss but not to turn in:

- 3.V1.** page 122, problem 6: Suppose x is a real number.
 - (a) Prove that if $x \neq 1$ then there is a real number y such that $\frac{y+1}{y-2} = x$.
 - (b) Prove that if there is a real number y such that $\frac{y+1}{y-2} = x$, then $x \neq 1$.
- 3.V2.** page 123, problem 22.
- 3.V3.** page 134, problem 12: Prove that $\forall x(\exists y \in \mathbb{R}(x + y = xy) \leftrightarrow x \neq 1)$.
- 3.V4.** page 145, problem 26.
- 3.V5.** page 153, problem 2: Prove that there is a unique real number x such that for every real number y , $xy + x - 4 = 4y$.