

Math 542 HW #5

due Monday, 10/1

- 1: #V.8.35 from Palka. This is *Lucas' theorem* on the relation between zeros of a complex polynomial and zeros of its derivative. We proved this in class earlier by another method. This problem asks you for a proof via contour integration.
- 2: #VIII.5.1 (i), (iii), (iv) from Palka.
- 3: #VIII.5.17 (i), (iii), (vii) from Palka.
- 4: #VIII.5.21 from Palka.
- 5: #VIII.5.27 from Palka. Hint: the trick is to understand what happens at zeros of f . Give a rigorous argument which shows that if f has a zero of multiplicity m at z_0 , then g also has a zero at z_0 , of multiplicity at least m .
- 6: #VIII.5.50 (i) and #VIII.5.53 (i) from Palka. Show all estimates and computation involved.