hw6 Due Wednesday October 7 at 11:59 p.m. (Section 2.3 is potentially on the Friday October 9 midterm.)

Do the following problems using the Theorems and definitions from section 2.3. These include the definitions of *homotopies with fixed endpoints* 2.3.6; and *homotopies of closed curves* 2.3.7; the precise (homotopy) definition of *simply connected* 2.3.8; the homotopy versions of the *Deformation Theorem* 2.3.12 and *Cauchy's Theorem* 2.3.14. Note that this discussion makes the proof of the *Antiderivative Theorem* 2.2.3 rigorous.

2.3 1, 3, 5, 6, 7abc (This week use homotopies.), 9. In 9b write down a homotopy from the given curve to the standard parameterization of the unit circle, in $\mathbb{C}\backslash\{0\}$, to justify your work.