Math 220C: Complex Analysis (UC San Diego, spring 2017)
Problem Set 3 (due Friday, April 28)

1. Let G be an open region in $\mathbb{C}$. Let $f : G \to \mathbb{C}$ be a function and suppose that $f'(z) = 0$ for some $z \in G$. Prove that f cannot be one-to-one on any open neighborhood of z. (Hint: for z_1 in some punctured neighborhood of z, the poles of $1/(f(z) - f(z_1))$ must be simple; but they can be counted by a suitable path integral.)

2. Conway, exercise IX.7.6.

3. Conway, exercise IX.7.9.

4. Conway, exercise X.1.2.

5. Conway, exercise X.1.5.

6. Conway, exercise X.1.8.