MATH 185-04: Complex Analysis

Additional Practice Problems for Midterm 1

1. I.4.1(b) and I.4.2(b)
2. I.5.2(b)
3. I.6.2(c)
4. 1.8.2
5. II.1.2
6. II.2.4
7. Determine, using the Cauchy-Riemann equations, whether $f : \mathbb{C} \to \mathbb{C}$ given by $f(z) = |z|^2 + 2iz \operatorname{Im}(z)$ is differentiable.
8. Show that $u(x, y) = x^2 - y^2 - x$ is harmonic. Find its harmonic conjugate $v(x, y)$, and find $f(z)$, written only in terms of z, such that $f(z) = u(x, y) + iv(x, y)$.
9. II.6.4
10. II.7.1(b)
11. Show that if f is analytic on a domain D, and $\operatorname{Re} f$ is constant on D, then f is constant on D.