Math V1202. Calculus IV, Section 004, Spring 2007

Extra Practice Problems for 16.8, 16.9, Appendix G, [F] Section 1, 2

16.8 2,7

16.9 9, 10, 16

Appendix G 31, 37, 39, 43, 45

[F] Section 1

1. Find all the possible values and write them in the form $a + bi$:
   (a) $\ln(\sqrt{3} - i)$ (b) $(-2)^{1+i}$

2. Beginning with the formula

$$\sin t = \frac{e^{it} - e^{-it}}{2i},$$

   find a formula for $\sin^{-1} x$ in terms of ln and square roots.

[F] Section 2

1. Let $f(z) = z^2/\bar{z}$.
   (a) Can $f(z)$ be continuously extended to $z = 0$? Explain.
   (b) Write $f(z)$ in the form $u + iv$.
   (c) Is $f(z)$ analytic where it is defined?

2. Let $u(x, y) = 3x^2y - y^3$.
   (a) Show that u is harmonic.
   (b) Find a harmonic function $v(x, y)$ such that $f(z) = u + iv$ is analytic. (Hint: Cauchy-Riemann equations)