MATH 3851 Homework Assignment 7 (due Thursday, March 8th)

Textbook problems:

Section 47: (p. 138-140) 2
Section 49: (p. 147) 2(a,c), 3
Section 53: (p. 159-162) 1(c), 2(c)
Section 57: (p. 170-172) 1(b), 2(a), 5

Extra problems:

• Find $\int_\Gamma \frac{e^z}{z^2+1}\ dz$, where Γ is the circle of radius 2 centered at 0, traversed clockwise. (Hint: you can't apply the Cauchy Integral Theorem since f has two points of non-analyticity inside Γ. Can you continuously deform Γ into two disjoint circles around the two points of non-analyticity of f?)

• Give an example of a contour Γ (with parametrization) for which $\int_\Gamma \frac{1}{z}\ dz = -3\pi i$. (This does not need to be a loop; in fact you can't do this problem with Γ a loop! Think about antiderivatives instead...)