1. Do the following contour integrals:

   (a)
   $$\int_\gamma z^2 \; dz, \quad \gamma(t) = e^{it} \sin^3 t, \;\; 0 \le t \le \pi/2.$$

   (b)
   $$\int_\gamma y \; dz,$$

   where $\gamma$ joins $0$ to $i$ and then $i$ to $i+2$.

2. Arfken, section 11.2, page 477, problem 11.2.10 a).

3. Arfken, section 11.3, page 485, problems 11.3.4, 11.3.6, and 11.3.7.