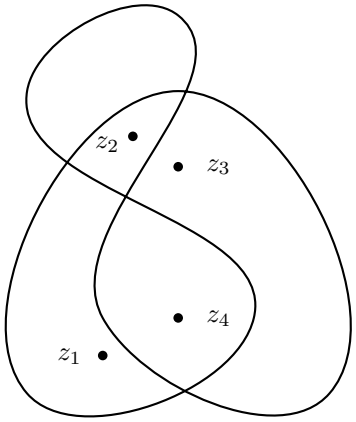
Math 403 Spring 2011
Homework 5 Additional problems

1. Compute the following line integrals:
   (a) $\displaystyle\int_{|z|=6} \frac{\sin z}{(z-i)(z-2)}dz$
   (b) $\displaystyle\int_{|z-i|=3} \frac{1}{e^{2z}(z-2i)(z-10)}dz$
   The circles should be oriented counter-clockwise.
2. Suppose γ is the following curve:



   Compute the following line integrals:
   (a) $\displaystyle\int_\gamma \frac{1}{z-z_1}dz$
   (b) $\displaystyle\int_\gamma \frac{1}{z-z_2}dz$
   (c) $\displaystyle\int_\gamma \frac{z}{z-z_3}dz$
   (d) $\displaystyle\int_\gamma \frac{ze^z}{z-z_4}dz$
   (e) $\displaystyle\int_\gamma \frac{1}{(z-z_2)(z-z_4)}dz$
   You should give γ an orientation that agrees with your answers above.
3. Explain why there is no function $f(z)$ that is analytic on the complex plane except at $z=0$ and $z=i$ such that $f'(z) = 1/(z^2-iz)$ for all $z \neq 0$ nor i.