MATH 307 — Worksheet #8

1. Evaluate the integral. All paths are positively oriented.

   (a) $\displaystyle\int_{|z|=1} \frac{z}{z^2+2z+5}\,dz$

   (b) $\displaystyle\int_{|z|=9} \frac{1}{e^z-1}\,dz$

   (c) $\displaystyle\int_{|z|=8} \tan z\,dz$

   (d) $\displaystyle\int_{|z|=3} \frac{5z-2}{z(z-1)}\,dz$

   (e) $\displaystyle\int_{\gamma} \frac{e^{-z^2}}{z^2}\,dz$, where γ is the square with vertices $\pm 1 \pm i$.

   (f) $\displaystyle\int_{|z|=1/2} \frac{1}{(1-z)^3}\,dz$

   (g) $\displaystyle\int_{|z-1|=1/2} \frac{1}{(1-z)^3}\,dz$

   (h) $\displaystyle\int_{|z-1|=1/2} \frac{e^z}{(1-z)^3}\,dz$

   (i) $\displaystyle\int_{|z|=3} \frac{\cos(z+2)}{z(z+2)^3}\,dz$