Due March 2

SP1: Let $\gamma(t) = 1 + \exp(it)$ for $t$ in $[0, 2\pi]$
Find the integral over $\gamma$ of $(z^2-1)^{-1}$ $dz$

SP2: Let $\gamma(t) = 2 \cdot \exp(it)$ for $t$ in $[-\pi, \pi]$
Find the integral over $\gamma$ of $(z^2-1)^{-1}$ $dz$

SP3: Integrate the conjugate of $z$ counterclockwise around the square with corners (-1,-1), (1,-1), (1,1) and (-1,1)

SP4: Integrate $\text{Arg } z$ along two line segments going from (-1,-$\delta$) to (1,0) and then from (1,0) to (-1, $\delta$) for $\delta$ positive. What is the limit as $\delta$ downarrow 0?
SP5: Integrate Log\( z \) along two line segments going from\((-1,-\delta)\) to\((1,0)\) and then from\((1,0)\) to\((-1,\delta)\) for \(\delta\) positive. What is the limit as \(\delta\) downarrow 0?

SP6: Integrate \((e^z-1)/z\) counterclockwise around the circle of radius 2 centered at \((0,0)\)