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Assignment 10 - Integration Theorem
Due April 16th

1. (2 pts) Compute $\int_C \frac{dz}{z^4-1}$ where C is the circle of radius 2 around 0, oriented positively.

Hint: $\frac{1}{z^4-1} = \frac{1}{4}(\frac{1}{z-1} - \frac{1}{z+1} + \frac{i}{z-i} - \frac{i}{z+i})$

2. (1 pt each) Compute the following integrals:

   a) $\int_C \cos z \, dz$ where C is the spiral $z(t) = te^{it}$, $t \in [0, 3\pi]$

   b) $\int_C e^z \, dz$ where C is the curve $z(t) = (1-t) + i\cos \pi t$, $t \in [0, 1]$

3. (1 pt) Compute $\int_C \frac{\sin^6 z}{z - \frac{\pi}{6}}$ where C is the circle of radius 1 around 0, oriented positively.