

Abbrevs. Let **SCC** mean “positively oriented simple-closed-contour”. For a **SCC** C , have $\overset{\circ}{C}$ be the (open) region C encloses, and let \widehat{C} mean C together with $\overset{\circ}{C}$. So \widehat{C} is $C \cup \overset{\circ}{C}$; it is automatically simply-connected and is a closed bounded set.

Use P.V. for “principal value”, and $\text{Log}()$ for P.V of logarithm. Use $\ln()$ for natural logarithm.

Let U be **SCC** $\text{Sph}_1(0)$, a circle of radius 1.

Prac-C1: Short answer. Show no work.

Write **DNE** in a blank if the described object does not exist or if the indicated operation cannot be performed.

a $\int_{-\infty}^{\infty} \frac{1}{[x^2 + 1]^2} dx =$ _____

b Compute $\int_0^{2\pi} \frac{1}{2 + \sin(\theta)} d\theta =$ _____

[Hint: CoV $z = e^{i\theta}$ works.]

c State (but do not prove) **MaxMP thm:** _____

Prac-C2: Prove: **THM** Suppose $f: D \rightarrow \mathbb{C}$ is holomorphic on path-connected open D . If $|f|$ is constant on D , then f is constant on D .

Prac-C3: **i** Carefully state the Cauchy Inequality thm.

ii Prove Cauchy’s Inequality directly from GCIF.

Prac-C4: **α** State the Gauss Mean value thm.

β Derive Gauss-MVT directly from CIF.