

PMAT 421 WINTER 08
Assignment #4 Due by Friday April 11, 4pm

I.D.#

NAME:

1. Find the residue at $z = -1$ of $f(z) = \frac{z^{12}}{(z+1)^{10}}$. [5]
2. Evaluate $\int_c \frac{\text{Log } z}{\sin(z-1)} dz$ where c is the circle $|z-3| = 2.5$ oriented positively. [7]
3. Find the residue at $z = 0$ of $f(z) = z^3 \cos \frac{2}{z}$. [5]
4. Find all singular points and then the residues of $f(z) = \frac{1}{e^{2z} + e^z(1-i) - i}$. [7]
5. Evaluate $\int_c \frac{z}{e^z + e^{-z}} dz$ where c is the circle $|z-2i| = 3$, positively oriented. [6]
6. Evaluate $\int_{-1}^1 z^i dz$ using the branch with $\arg z \in \left(\frac{\pi}{2}, \frac{3}{2}\pi\right)$. [5]
7. Classify all singular points of $f(z) = \frac{1}{e^{z^2} - 1}$ and then find all residues. [8]
8. Evaluate $\int_0^\infty \frac{x^2 + 1}{x^4 + 1} dx$. Explain all steps. [7]

TOTAL out of 50: