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

I.D.# **NAME:**

1. Find the residue at $z = -1$ of $f(z) = \dfrac{z^{12}}{(z+1)^{10}}$. [5]

2. Evaluate $\displaystyle\int_c \frac{Log\ z}{\sin(z-1)}dz$ where c is the circle $|z-3| = 2.5$ oriented positively. [7]

3. Find the residue at $z = 0$ of $f(z) = z^3 \cos\dfrac{2}{z}$. [5]

4. Find all singular points and then the residues of $f(z) = \dfrac{1}{e^{2z} + e^z(1-i) - i}$.. [7]

5. Evaluate $\displaystyle\int_c \frac{z}{e^z + e^{-z}}dz$ where c is the circle $|z - 2i| = 3$, positively oriented. [6]

6. Evaluate $\displaystyle\int_{-1}^{1} z^i dz$ using the branch with $\arg z \in \left(\frac{\pi}{2}, \frac{5}{2}\pi\right)$. [5]

7. C;assify all singular points of $f(z) = \dfrac{1}{e^{z^2} - 1}$ and then find all residues. [8]

8. Evaluate $\displaystyle\int_0^{\infty} \frac{x^2+1}{x^4+1}dx$ .Explain all steps. [7]

TOTAL out of 50: