Name: _____

Please show all work and explain your answers.

1. Sketch the regions $\{z : |z - i| \le |z - 1|\}$ and $\{z: |z + i| \ge 2\}$.

2. Let $f(z) = |z|^2$. At which z is $f(z)$ complex differentiable? Analytic? Explain.

3. Integrate $(\operatorname{Re} z + \operatorname{Im} z)\, dz$ along the right half circle centered at 1 from $1 - i$ to $1 + i$.

4. Integrate $\dfrac{\cos(z)}{z^3}\, dz$ and $\dfrac{\cos(z)}{z^2 + 2z}\, dz$ counterclockwise around the unit circle.

5. Expand $1/z$ in a Taylor series at $z = 1 + i$. What is the disc of convergence?

1	2	3	4	5	total (50)	%

Prelim. course grade: _____ %