SIIT MAS210 First Semester 2006 - Quiz 4 - Dr. Ruben

Each correct answer is 25 points. Each wrong answer is –6 points

Problem 1. Given the functions $f(z) = e^z$ and $g(z)$ = Re z, which of the following is true?
(1) $f(z)$ is analytic at all complex points z and g(z) is not analytic at any complex point z
(2) $f(z)$ is not analytic and g(z) is analytic at all complex points z
(3) both $f(z)$ and g(z) are analytic at all complex points z
(4) neither $f(z)$ nor g(z) are analytic at all complex points z
(5) $f(z)$ is analytic only inside the circle $z = e^{it}$, $0 < t < 2\pi$ and g(z) is analytic on the complex plane

Problem 2. If $z = \sqrt{2} + i\sqrt{2}$ then ln z =
(1) ln z = $\ln\sqrt{2} + i\sqrt{2}$
(2) ln z = ½ + $i\pi$
(3) ln z = ln 2 + $i\ \pi/4$
(4) ln z = ln ($\sqrt{3}/2$) + i
(5) ln z = $e^2 + 2i$

Problem 3. Let $z = 1 – (\pi/2)\ i$. Then e^z =
(1) $e^z = e^1 - e^{i}$
(2) $e^z = e^{1-i}$
(2) $e^z = e(\cos 1 – i \sin 1)$
(3 $e^z = -ie$
(4) $e^z = \sqrt{2}(\cos 1 - \sin(\pi/4)$
(5) e^z = ln $(1 – i)$

Problem 4. Let $f(z) = ze^{-z}$. Then $f'(-i)$ =
(1) $f'(-i) = e^{i}(1 + i)$
(2) $f'(-i) = 1 + e^{-i}$
(2) $f'(-i) = \cos(\pi/2) + i \sin(\pi/2)$
(3) $f'(-i) = -ie^{i}$
(4) $f'(-i)$ = ln $(i) + i$ arg $(\pi/4)$
(5) $f'(-i) = e^{-1}$