Prof. Haiman Math 1A—Calculus Fall, 2006

Quiz 12 solutions—version A

Name _____ Student ID Number _____

1. Evaluate the indefinite integral

$$\int e^x \sin(1+e^x)\, dx$$

Let $u = 1 + e^x$, so $du = e^x dx$. Then

$$\int e^x \sin(1+e^x)\, dx = \int \sin u\, du = -\cos u + C = -\cos(1+e^x) + C$$

2. Find constants a, b and k such that

$$\int_2^\pi e^{x^2}\, dx = k \int_a^b \frac{e^x}{\sqrt{x}}\, dx.$$

Let $u = x^2$, so $x = \sqrt{u}$, and $dx = du/(2\sqrt{u})$. Then

$$\int_2^\pi e^{x^2}\, dx = \int_4^{\pi^2} \frac{e^u}{2\sqrt{u}}\, du.$$

Therefore $a = 4$, $b = \pi^2$, and $k = 1/2$.