Quiz 4, January 21, 2015

Find $\int \frac{dz}{e^z + e^{-z}}$.

Answer: Let $u = e^z$. It follows that $du = e^z dz$. The original problem is equal to

$$\int \frac{e^z dz}{e^{2z} + 1} = \int \frac{du}{u^2 + 1} = \arctan u + C = \boxed{\arctan(e^z) + C}.$$

Check: The derivative of the proposed answer is

$$\frac{e^z}{e^{2z} + 1} = \frac{1}{e^z + e^{-z}}. \checkmark$$