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Quiz – January 22, 2004

Find $\int_0^1 e^{2x+3} dx$.

Answer: Let $u = 2x + 3$. It follows that $du = 2dx$, or $\frac{1}{2}du = dx$. When $x = 0$, $u = 3$. When $x = 1$, $u = 5$. The original problem is equal to

$$\frac{1}{2} \int_3^5 e^u du = \frac{1}{2} e^u \Big|_3^5 = \boxed{\frac{1}{2}(e^5 - e^3)}.$$