To be handed in no later than 10:30 a.m., Friday, June 25

Let $I_n = \int_0^1 x^n e^{x-1} dx$.

1. Show that $I_1 = \frac{1}{e} \approx 0.36787944117144$.

2. Integrate by parts to obtain the formula:

$$I_n = 1 - nI_{n-1} \text{ for } n = 2,3,4, \ldots.$$

3. Use the recipe in **2** to compute $I_2, I_3, \ldots, I_{50}$. (Do these calculations numerically; do not do them symbolically.)

4. Do have any intelligent comments about all of this?