

1. Evaluate the indefinite integral

$$\int e^x \cos(e^x) dx$$

2. Evaluate the integral

$$\int_0^1 \frac{y}{e^{2y}} dy$$

**Bonus** Let  $f$  be a differentiable function. Compute

$$\int_a^b f'(x)f(x)dx$$

in terms of  $f(a)$  and  $f(b)$ .