

$$1. \qquad \int \cos\left(1 + e^x\right) e^x \, dx =$$

$$2. \qquad \int e^{1-\cos(x)}\sin(x)\,dx =$$

3.
$$\int \sec\left(\frac{1}{x}\right) \tan\left(\frac{1}{x}\right) \frac{1}{x^2} dx =$$

$$4. \qquad \int_0^{\frac{\sqrt{\pi}}{2}} x \sin(x^2) \, dx =$$