

$$3) \int 5x e^{-x^2} dx$$

$$u = -x^2$$
$$du = -2x dx$$
$$-\frac{1}{2} du = x dx$$

$$-\frac{1}{2} \cdot 5 \cdot \int e^u du$$

$$-\frac{5}{2} e^{-x^2} + C$$

$$4) \int_0^1 \frac{e^x}{1+e^x} dx$$

$$u = 1 + e^x$$
$$du = e^x dx$$

$$u(0) = 2$$

$$u(1) = 1 + e$$

$$= \int_2^{1+e} \frac{1}{u} du$$

$$= \ln |u| \Big|_2^{1+e}$$

$$= \ln(1+e) - \ln 2$$

$$\ln\left(\frac{1+e}{2}\right)$$