7
a

CHANGING VARIABLES

$$\int_0^1 x\, e^{-x^2}\, dx$$

$$x \longrightarrow t = \frac{(b-a)x + \alpha\beta - b\alpha}{\beta - \alpha}$$

$$\int_0^1 x\, e^{-x^2}\, dx = \int_0^1 f(x)\, dx \longrightarrow \int_{-1}^{1} g(t)\, dt$$

$$g(t) = f(t(x)) = \left[\left(\frac{2x+0}{-1}\right) e^{-\left(\frac{2x+0}{-1}\right)^2}\right]$$

$$= -2x\, e^{-2x^2}$$

$$\int_0^1 x\, e^{-x^2}\, dx \longrightarrow -\int_{-1}^{1} 2x\, e^{-2x^2}\, dx$$

} TRANSFORMED INTEGRAL