

### PROOF OF FORMULA 3.327

$$\int_0^{\infty} e^{-ae^{nx}} dx = -\frac{1}{n}\text{Ei}(-a)$$

Let  $u = e^{nx}$  to obtain

$$\int_0^{\infty} e^{-ae^{nx}} dx = \frac{1}{n} \int_1^{\infty} \frac{e^{-au}}{u} du.$$

The change of variables  $t = -au$  gives

$$\int_1^{\infty} \frac{e^{-au}}{u} du = - \int_{-\infty}^{-a} \frac{e^t}{t} dt.$$

This is the result.