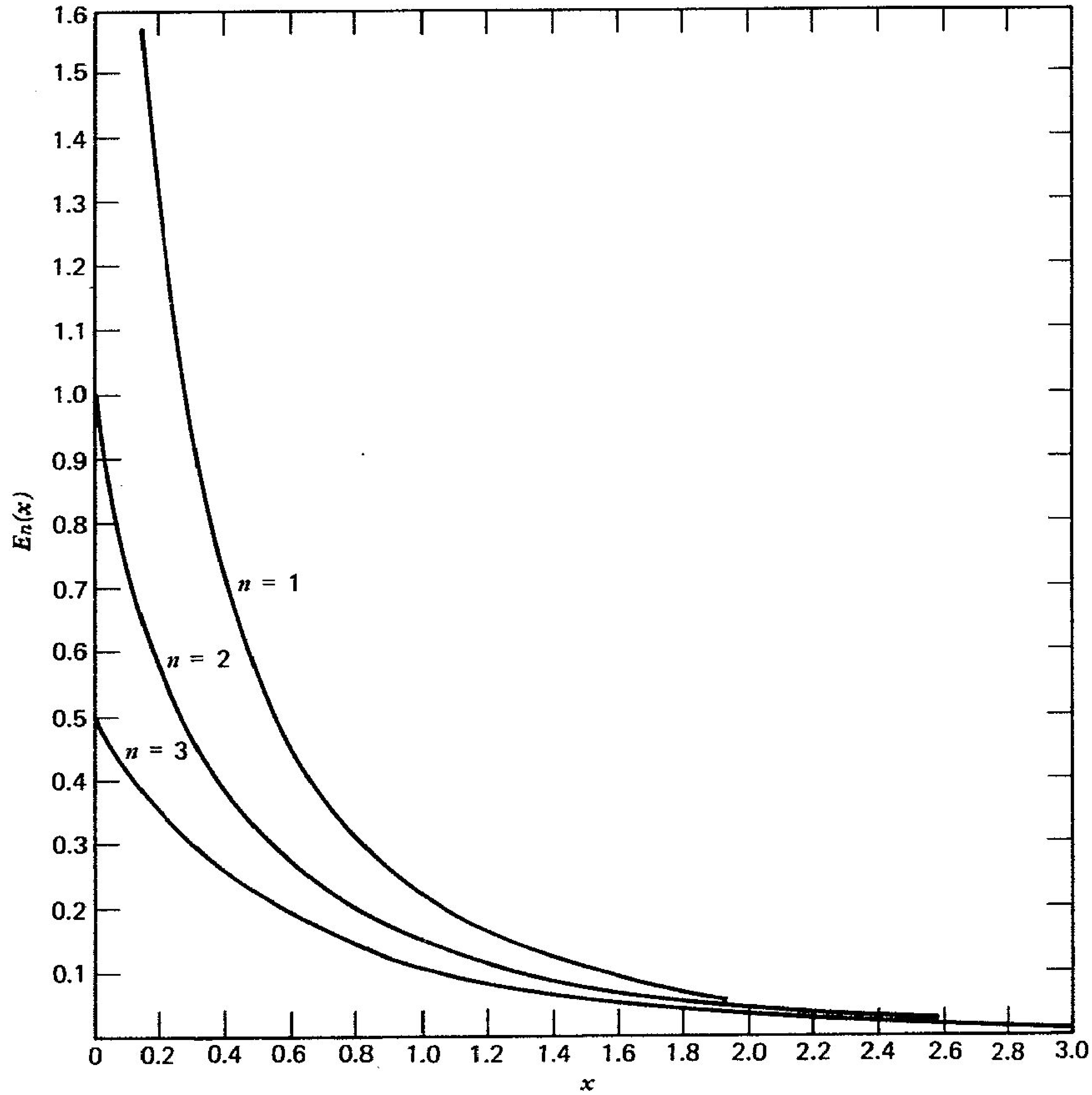

Fig. 7.4. Here are plots of the first three exponential integrals, $E_1(x)$, $E_2(x)$, and $E_3(x)$. At $x = 0$, E_1 is unbounded, E_2 is unity, and E_3 is 0.5. At large x, all the functions behave the same.

Exponential integrals

Let us repeat the equation for the exponential integrals, $E_n(x)$, of the nth order

$$E_n(x) = \int_1^\infty \frac{\exp(-xt)}{t^n} \mathrm{d}t. \qquad (7.19)$$

The value at the origin is found directly by setting $x = 0$, leaving

$$E_n(0) = \int_1^\infty \frac{\mathrm{d}t}{t^n} = \frac{1}{n-1}.$$

The first three functions are shown in Fig. 7.4, where it can be seen that $E_1(0)$ is infinite, $E_2(0)$ is unity, and $E_3(0)$ is one half.