- **Exercise 4.18**
  The integral
  $$\int_0^\infty \frac{x^3}{e^x - 1} dx \tag{1}$$
  appears in Planck's treatment of black body radiation. Perform the integral numerically, with Gauss-Laguerre integration using 2, 4, 6 and 8 points.

- **Exercise 4.22**
  Consider a square region in the xy-plane, such that $-1 \le x \le 1$ and $-1 \le y \le 1$, containing a uniform charge distribution ρ. The electrostatic potential at the point (x_p, y_p) due to this charge distribution is obtained by integrating over the charged region,
  $$\Phi(x_p, y_p) = \frac{\rho}{4\pi\epsilon_0} \int_{-1}^{1} \int_{-1}^{1} \frac{dx dy}{\sqrt{(x - x_p)^2 + (y - y_p)^2}}. \tag{2}$$
  Write a two dimensional integration routine to evaluate $\Phi(x_p, y_p)$, and create a table of values for $x_p, y_p = 2, 4, ..., 20$. Use a sufficient number of points in your integration scheme to guarantee 8-significant digit accuracy in the final result.

- **Exercise 4.26**
  Evaluate the 9-dimensional integral
  $$I = \int_0^1 ... \int_0^1 \frac{da_x da_y da_z db_x db_y db_z dc_x dc_y dc_z}{(\vec{a} + \vec{b}) \cdot \vec{c}} \tag{3}$$
  Use a sufficient number of points in the Monte Carlo integration so that the estimated standard deviation is less than 10% of the estimated integral.