1. (J & C 6.3) Calculate the solid angle subtended by the corner of a room.

2. (J & C 6.4) Integrate the expression for differential scatter cross section

\[
\frac{d\sigma_0}{d\theta} = \frac{r_0^2}{2} \left(1 + \cos^2 \theta\right)2\pi \sin \theta
\]

and calculate the total Thomson classical cross section \(\sigma_0\).

3. (J & C 6.5) Find the number of photons scattered between cones of angle 30° and 35° when a beam of \(10^6\) low-energy photons impinges on a scattering medium containing \(10^{23}\) electrons cm\(^{-2}\). Assume classical scattering.