1. [2 points] Calculate the atomic packing factor (APF) for the bcc unit cell.

2. [3 points] Nickel has the fcc structure and a lattice parameter of $a = 0.3517$ nm.
   a. Determine the atomic radius in nm.
   b. Determine the atomic volume $\Omega$ in nm$^3$ (assume a spherical atom shape).
   c. Determine the density in g/cm$^3$ and compare this answer to the Ni density value given in the table at the front of your textbook.

3. [4 points] Sketch an fcc unit cell.
   a. Determine the planar density for the $(111)$.
   b. Determine the planar density for the $(110)$.
   c. Determine the linear density for the $[01\bar{1}]$.
   d. Determine the linear density for the $[100]$.

4. [2 points] Calculate the planar densities for the $(111)$ and the $(110)$ in the bcc structure.


6. [1 point] Are the properties of single crystals isotropic? Explain your answer.