Assignment 2

Distance with metric tensor:

- Crystal has lattice parameters of {2, 2, 3, 90, 90, 90} (distances in nm and angles in degrees). Atoms are present at $\left(\frac{1}{2}, \frac{1}{3}, \frac{1}{4}\right)$ and $\left(\frac{1}{3}, \frac{1}{2}, \frac{1}{4}\right)$.
  - Compute the distance between the atoms.

Angle with metric tensor:

- Consider a monoclinic crystal with lattice parameters a = 4 nm, b = 6 nm, c = 5 nm and β = 98°.
  - What is the angle between the $[101]$ and $[\bar{2}01]$ directions.

Drawing directions and planes:

- Consider the unit cell of a cP lattice. Determine the Miller indices of the following directions
  - Vector starting at $\left(\frac{2}{3}, 0, 1\right)$ and ending at $\left(0, \frac{1}{2}, 1\right)$
  - Vector starting at $\left(\frac{1}{3}, 1, 0\right)$ and ending at $\left(1, 0, \frac{2}{3}\right)$
  - Vector starting at $\left(\frac{1}{3}, 1, 1\right)$ and ending at $\left(\frac{2}{3}, 0, 0\right)$

Problem in the last slide of Lecture 3-5.