

## HW 4:

Prob 1: Prove that the rotation axes in crystals can only be 2, 3, 4, or 6-fold. All other rotation symmetries, say, a 5-fold rotation axis, are not allowed in crystals.

— More reading: 5-fold axis in  $C_{60}$ , quasi-crystals.  
(please google and find materials).

Prob 2: Work out the first Brillouin zones of fcc <sup>and bcc</sup> lattices. Write down the coordinates of each vertex and central points of each face.

Prob 3: Ashcroft / Mermin, Chap 9.1 on page 169.