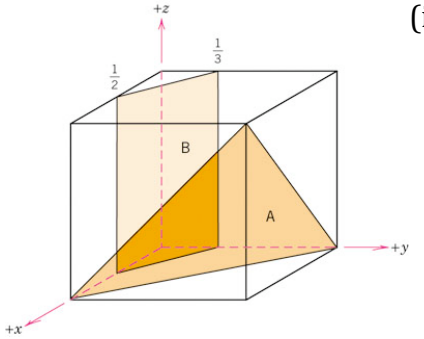
**PHYS 225: Applications of Modern Physics** **Marie Lopez del Puerto**

# HW #10

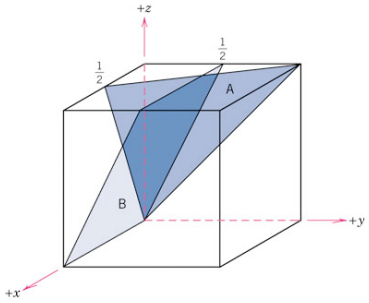
1. Sketch a unit cell of the following crystals:
   a) Copper, which has a BCC structure with base (0,0,0)
   b) Gallium Arsenide (GaAs), which has an FCC structure with Ga atoms at (0,0,0), and As atoms at (¼, ¼, ¼)
   c) Cesium chloride (CsCl) which has a simple cubic structure with Cs atoms at (0,0,0), and Cl atoms at (½, ½, ½ ).

2. Determine the Miller indices for the planes shown in the following unit cells:

i)




(ii)




3. **(Derivation for Exam 2)** Using geometrical arguments, derive Bragg's law for a simple cubic system. Make sure to include a drawing with a source, detector, incoming and reflected rays, and appropriate labels for lengths and angles.