

1. Do integer numbers form a group with respect to addition and multiplication operations? Proof it. This group is finite?

2. Define the basis vectors of primitive unit cell for crystal MgO. What Bravais lattice is in the basis of this lattice? Define the cartesian coordinates of basis vectors and all atoms inside of primitive unit cell. Define the number of space group. Calculate the volume of primitive unit cell. Calculate the volume of primitive unit cell.

3. Draw the planes for  $\langle 111 \rangle$ ,  $\langle \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \rangle$ ,  $\langle 0, \frac{1}{2}, \frac{1}{2} \rangle$ ,  $\langle 0, \frac{1}{4}, \frac{1}{4} \rangle$ ,  $\langle 0, 0, \frac{1}{4} \rangle$  Miller indices in  $\Gamma_c$  lattice.