

HW#1

(due 02/04/13)

Reading

Omar (O) Chapter 1

Handouts 1&2 on quasicrystals

① O. Ch. 1, Pr. 1

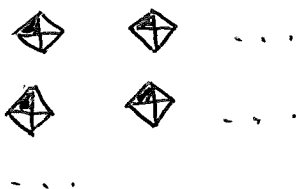
② O. Ch. 1, Pr. 4

③ Show that the volume of the primitive unit cell is $\frac{a^3}{2}$ for the bcc lattice & $\frac{a^3}{4}$ for the fcc lattice, where a is the side of the cube.

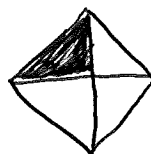
④ Consider a lattice with primitive vectors $\vec{a}_1, \vec{a}_2, \vec{a}_3$. Calculate the Miller indices of the plane with intercepts at $4\vec{a}_1, 2\vec{a}_2, -3\vec{a}_3$. What is the direction perpendicular to this plane?

⑤ For one infinite "crystal" & two polygons below, identify the point group symmetry operations. Which operations are shared by all three?

(a) regular lattice



(b)



(c)

