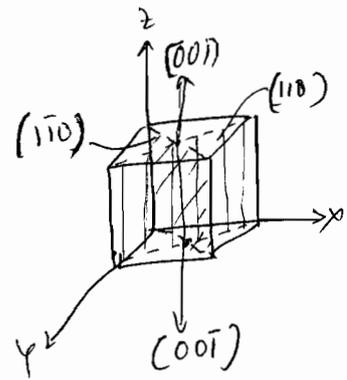


Solutions Quiz 2  
Section A

1)  $\cos \theta = 0 \Rightarrow \theta = 90^\circ$



2) Intercept: 6, 3, 6

in terms of units distance:  $6 \quad 3 \quad 3 = 2 \quad 1 \quad 1$

Inverse:  $\frac{1}{2} \quad 1 \quad 1$

Rationalize: (122)

3)  $d_{hkl} = \frac{a}{\sqrt{h^2+k^2+l^2}} = 1.125 = \frac{a}{\sqrt{14}} \Rightarrow a = \sqrt{14} \times 1.125 \text{ \AA}$

$a = 4.21 \text{ \AA}$

Vol. =  $a^3 =$

4) a) iii

b) ii

5) a) Cr, ~~Fe~~ etc (Any)

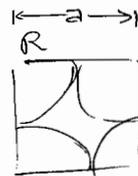
b) Cu, ~~Ni~~ etc (Any)

c) Po

Section B Quiz-2

1)

SC :  $a = 2R$   
 $\Rightarrow R = \frac{a}{2} = 3 \text{ \AA}$



BCC :  $\sqrt{3}a = 4R$   
 $\Rightarrow R = \frac{\sqrt{3}a}{4}$   
 $= \frac{\sqrt{3}}{4} \times 6 \text{ \AA} = \frac{3\sqrt{3}}{2} \text{ \AA}$



FCC :  $4R = \sqrt{2}a$   
 $\Rightarrow R = \frac{\sqrt{2}a}{4}$   
 $= \frac{\sqrt{2}}{4} \times 6 \text{ \AA} = \frac{3\sqrt{2}}{2} \text{ \AA}$



2)

x-ray :  $E = \frac{hc}{\lambda} = \frac{12420 \text{ eV-\AA}}{1 \text{ \AA}} \approx 12.42 \text{ keV}$

↓  
 Deduct the energy  
 in Joules. } Multiply by

$e^{-}$  :  $\left. \begin{aligned} p &= mv \\ E &= \frac{1}{2}mv^2 \end{aligned} \right\} \Rightarrow p = \sqrt{2mE}$

$\lambda = \frac{h}{p} = \frac{h}{\sqrt{2mE}}$

$\Rightarrow E = \frac{h^2}{2m\lambda^2}$  in Joules.