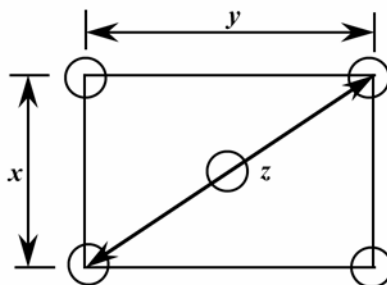


equivalence of 2 atoms associated with this BCC (110) plane. The planar section represented in the above figure is a rectangle, as noted in the figure below.



From this figure, the area of the rectangle is the product of x and y . The length x is just the unit cell edge length, which for BCC (Equation 3.3) is $\frac{4R}{\sqrt{3}}$. Now, the diagonal length z is equal to $4R$. For the triangle bounded by the lengths x , y , and z

$$y = \sqrt{z^2 - x^2}$$

Or

$$y = \sqrt{(4R)^2 - \left(\frac{4R}{\sqrt{3}}\right)^2} = \frac{4R\sqrt{2}}{\sqrt{3}}$$

Thus, in terms of R , the area of this (110) plane is just

$$\text{Area (110)} = xy = \left(\frac{4R}{\sqrt{3}}\right)\left(\frac{4R\sqrt{2}}{\sqrt{3}}\right) = \frac{16R^2\sqrt{2}}{3}$$

And, finally, the planar density for this (110) plane is just

$$\begin{aligned} \text{PD}_{110} &= \frac{\text{number of atoms centered on (110) plane}}{\text{area of (110) plane}} \\ &= \frac{\frac{2 \text{ atoms}}{\frac{16R^2\sqrt{2}}{3}}}{3} = \frac{3}{8R^2\sqrt{2}} \end{aligned}$$