Calculate z-coord:

$$\theta = \sin^{-1}\left(\frac{x_1}{r}\right)$$

$$x_n = r \sin n\theta$$

$$z_n = r \cos n\theta$$
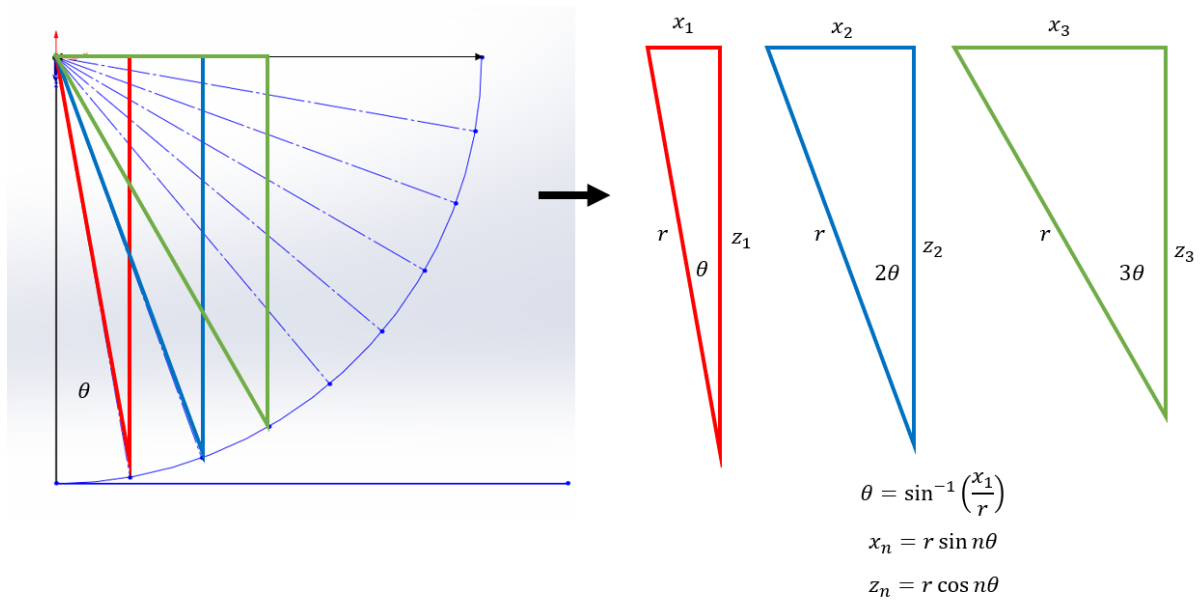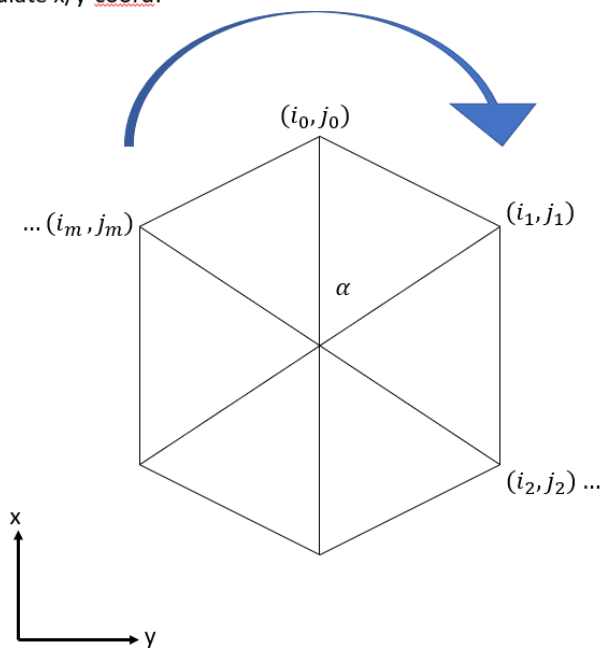
Calculate x/y-coord:

$$\alpha = \frac{2\pi}{m} \text{ where } m = \text{no. of vertices}$$

$$i_0 = x_n \qquad j_0 = 0$$

$$i_m = i_0 \sin m\alpha$$

$$j_m = i_0 \cos m\alpha$$

For pin layer n, $m = 6n$
(for hexagonal origin
layer)