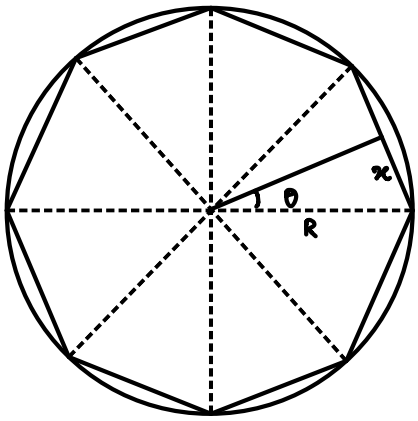
Consider a circle with radius R a hexagon inscribed in it.



Define $n = 6$ (number of sides)

$$\theta = \frac{360}{2n} = \frac{180^\circ}{n}$$

$$\frac{x}{R} = \sin\theta$$

$$\frac{x}{R} = \sin\frac{180}{n} \quad - \quad (1)$$

for an n sided figure, it's outer boundary is therefore,

$$C = 2nx$$

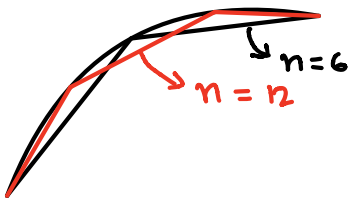
$$\pi = \frac{C}{2R}$$

$$= \frac{2nx}{2R}$$

$$= n\left(\frac{x}{R}\right) \quad - \quad (2)$$

From (1) & (2),

$$\pi = n \sin\left(\frac{180^\circ}{n}\right)$$



$$\pi = \sum_{k=0}^{\infty}\left[\frac{1}{16^k}\left(\frac{4}{8k+1} - \frac{2}{8k+4} - \frac{1}{8k+5} - \frac{1}{8k+6}\right)\right]$$

General form,

$$\alpha = \sum_{k=0}^{\infty}\left[\frac{1}{b^k}\,\frac{p(k)}{q(k)}\right]$$

↙ irrational number