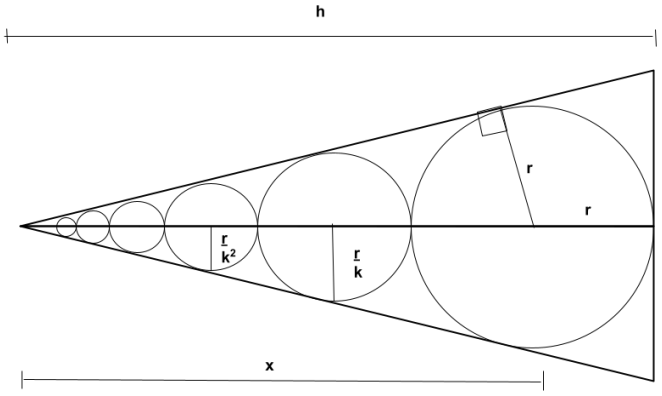

$$h = x + r$$
$$sin\left(\frac{\theta}{2}\right) = \frac{r}{x}$$
$$h = \frac{r}{sin\left(\frac{\theta}{2}\right)} + r$$

$$h = 2r * \sum_{n=1}^{\infty} \left(\frac{1}{k}\right)^{n-1}$$

$$S = 1 + \frac{1}{k} + \frac{1}{k^2} + \ldots + \left(\frac{1}{k}\right)^{n-1}$$
$$-\frac{1}{k}S = \frac{1}{k} + \frac{1}{k^2} + \ldots + \left(\frac{1}{k}\right)^{n-1} + \left(\frac{1}{k}\right)^{n}$$
$$S - \frac{1}{k}S = 1 - \left(\frac{1}{k}\right)^{n}$$
$$S = \frac{1-\left(\frac{1}{k}\right)^{n}}{1-\frac{1}{k}}$$

$$\lim_{n\to\infty} \frac{1-\left(\frac{1}{k}\right)^{n}}{1-\frac{1}{k}} = \frac{1}{1-\frac{1}{k}} = \frac{k}{k-1}$$

$$2r * \frac{k}{k-1} = \frac{r}{sin\left(\frac{\theta}{2}\right)} + r$$

$$k = \frac{1+sin\left(\frac{\theta}{2}\right)}{1-sin\left(\frac{\theta}{2}\right)} \quad \text{and} \quad \theta = 2sin^{-1}\left(\frac{k-1}{k+1}\right)$$