#9 Find dimensions of an dielectric coax cable with $Z_0 = 300 \Omega$.
$\varepsilon_r = 1$, choose inner conductor between 1um to 10mm.
A common formula for $Z_0$ of coax is

$$Z_0 = \frac{60}{\sqrt{\varepsilon_r}} \ln\left(\frac{D}{d}\right); \quad D: \text{outer shield diameter}$$
$$d: \text{inner conductor diameter}$$

$$300 = 60 \ln\left(\frac{D}{1mm}\right); \text{let } d = 1mm$$

$$\varepsilon^s = \frac{D}{1mm}$$

$$148.4 = \frac{D}{1mm}; \quad D = 148mm$$

1mm dia (0.039")

148mm (5.8")