

## J00E.1—A Two-Wire Transmission Line

### Problem

A transmission line consists of a pair of conducting wires each of radius  $a$  whose centers are distance  $b$  apart. The space surrounding the wires has unit dielectric constant and permeability. Deduce the capacitance  $C$  per unit length.

[From this you could deduce the inductance  $L$  per unit length using  $LC = 1/c^2$ , the impedance  $Z = \sqrt{L/C} = 1/cC$ , and the sensitivity of the impedance to an error  $\delta b$  in the wire spacing, *etc.*]