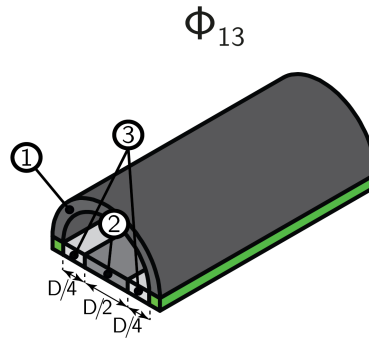# View Factor 33

**Determine for a long semi-circular body the view factor $\Phi_{13}$:**



A flat plate can never see itself and therefore:

$$\Phi_{22} = \Phi_{33} = 0$$

Surfaces 2 and 3 cannot see each other and therefore:

$$\Phi_{23} = \Phi_{32} = 0$$

From the summation rule $(\Phi_{31} + \Phi_{32} + \Phi_{33} = 1)$ one finds:

$$\Phi_{31} = 1$$

Using the reciprocity rule $(\Phi_{13}A_1 = \Phi_{31}A_3)$:

$$\Phi_{13} = \Phi_{31}\frac{A_3}{A_1} = \frac{\left(\frac{1}{4} + \frac{1}{4}\right)DL}{\frac{1}{2}\pi DL} = \frac{1}{\pi}$$