Derivation of the Equations 13.0 - 13.1

Assumptions:
- non-participating medium between surfaces (vacuum, gas)
- no effect on radiation exchange between surfaces
- surfaces are gray and diffuse (emit, absorb and reflect diffusely)
- radiation leaving the surface is considered to be radiant leaving directly toward (means without intervening reflections)
- radiation is uniform

\[ I_j = I_{\text{incident}} + \rho I_{\text{incident}} \]
intensity leaving a surface is diffuse (does not depend on direction)
- any incident radiation is reflected diffusely
- surfaces are gray

\[ q_{\text{in}} = (\pi I_j) \cdot A_j \]
\[ q_{\text{out}} = (\pi I_i) \cdot A_i \]

\[ F_{\text{in, out}} = \frac{\text{intercepted}}{\text{leaving}} = \frac{q_{\text{in, out}}}{q_{\text{in}}} \]

13.0

13.1