reflected ray
\[ k(\rho) = m_k \rho + c_k \]

incident ray
\[ j(\rho) = m_j \rho + c_j \]

caustics curve

virtual sphere's centre / origin
\[ \rho = \sqrt{x^2 + y^2} \]

virtual sphere
\[ s(\rho) = \sqrt{R^2 + \rho^2} \]