Numerical calculation

$$n1 := 1 \qquad n2 := 1.5 \qquad n3 := 2 \qquad i := \sqrt{-1}$$

for a single interface, that is

$$M11 := 1 \qquad M12 := 0$$

$$M21 := 0 \qquad M22 := 1$$

$$tt := \frac{-2\cdot[n1\cdot(M21\cdot M12 - M22\cdot M11)]}{M21 + M22\cdot n1 + n3\cdot M11 + n3\cdot M12\cdot n1}\cdot\overline{\frac{-2\cdot[n1\cdot(M21\cdot M12 - M22\cdot M11)]}{M21 + M22\cdot n1 + n3\cdot M11 + n3\cdot M12\cdot n1}}$$

$$tt = 0.444$$

$$R := \left[\frac{-(-n3\cdot M12\cdot n1 - M22\cdot n1 + M21 + n3\cdot M11)}{(M21 + M22\cdot n1 + n3\cdot M11 + n3\cdot M12\cdot n1)}\right]^2$$

$$R = 0.111$$

One sees that R+TT is not 1 and tt is not the transmitted power

However if n3*tt is the transmitted power T, one has

$T := n3\cdot tt \qquad T = 0.889$ and $T + R = 1$

and if n1 is not 1 we have more generally to write

$$T := \frac{n3}{n1}\cdot tt$$

For antireflection coating one has eq. 6.27

$$r = \left[\frac{-(-n3 \cdot MM12 \cdot n1 + MM21)}{(MM21 + n3 \cdot MM12 \cdot n1)}\right]$$

$$MM12(nn2) = \frac{-i}{nn2} \qquad MM21(nn2) = -i \cdot nn2$$

Since -i cancels out we have

$$MM12(nn2) := \frac{1}{nn2} \qquad MM21(nn2) := nn2$$

$$nn2 := 1.1, 1.11 .. 2 \qquad nn1 := 1 \qquad nn3 := 1.5$$

$$R(nn2) := \left[\frac{-(-nn3 \cdot MM12(nn2) \cdot nn1 + MM21(nn2))}{(MM21(nn2) + nn3 \cdot MM12(nn2) \cdot nn1)}\right]^2$$