HW assignment 5. Due Thu Feb 22

Problem 1.

A rectangular wave guide with square cross section ($a = b$) is filled with the dielectrics characterized by μ, ϵ up to $z = 0$ and by μ', ϵ' at $z > 0$. The constants are arranged in such a way that the speed of light in both media is the same ($\mu\epsilon = \mu'\epsilon'$). A $\mathrm{TM}_{1,1}$ wave with frequency ω (larger than the cutoff frequency) is incident on the boundary between the two media. Find the reflected and transmitted waves.