1. Consider two identical mirrors $M_1$ and $M_2$, each with reflectance $R = 99\%$ and transmittance $T = 1\%$, as schematically shown below:

$I = 100\%$ \hspace{1cm} \rightarrow \hspace{1cm} $M_1$

$R = 99\%$ \hspace{1cm} \leftrightarrow \hspace{1cm} \rightarrow \hspace{1cm} T = 1\%

$I = 100\%$ \hspace{1cm} \rightarrow \hspace{1cm} $M_2$

$R = 99\%$ \hspace{1cm} \leftrightarrow \hspace{1cm} \rightarrow \hspace{1cm} T = 1\%$

When the mirrors are placed next to each other and separated by a distance $d$ as shown below, what is the reflectance and transmittance of the whole system?

$I = 100\%$ \hspace{1cm} \rightarrow \hspace{1cm} $M_1$ \hspace{1cm} $M_2$

$R = ?$ \hspace{1cm} \leftrightarrow \hspace{1cm} \rightarrow \hspace{1cm} T = ?$
2. Consider the experiments below with two light sources and a detector: the power measured in case I (source A opened, source B blocked) is $P$ and in case II (source A blocked, source B opened) is also $P$.

What power will be measured when both sources are opened?

If the power measured is different from $2 \times P$, what happened to the conservation of energy?
3. If you illuminate an opaque object with a hole, what will be the light intensity pattern on a screen behind the object? Is the intensity pattern similar to the shape of the hole or not?