Consider the double concave confocal cavity shown below:

(a) Find the roundtrip ABCD matrix (Choose the starting point to be just before mirror 2).
(b) Discuss the stability of this cavity for the symmetric $R_1=\infty$, and asymmetric $R_1 \neq \infty$ cases.
(c) A ray parallel to optical axis is incident on mirror 2 at a distance $x_0$ as shown. Derive an expression for the position $x(s)$ of this ray (on mirror 2) as a function of roundtrip number $s$. Discuss your results for cases $R_1=\infty$, $R_1 > R_2$ and $R_1 < R_2$.
(d) Draw the ray diagram for a few round trips in each case.