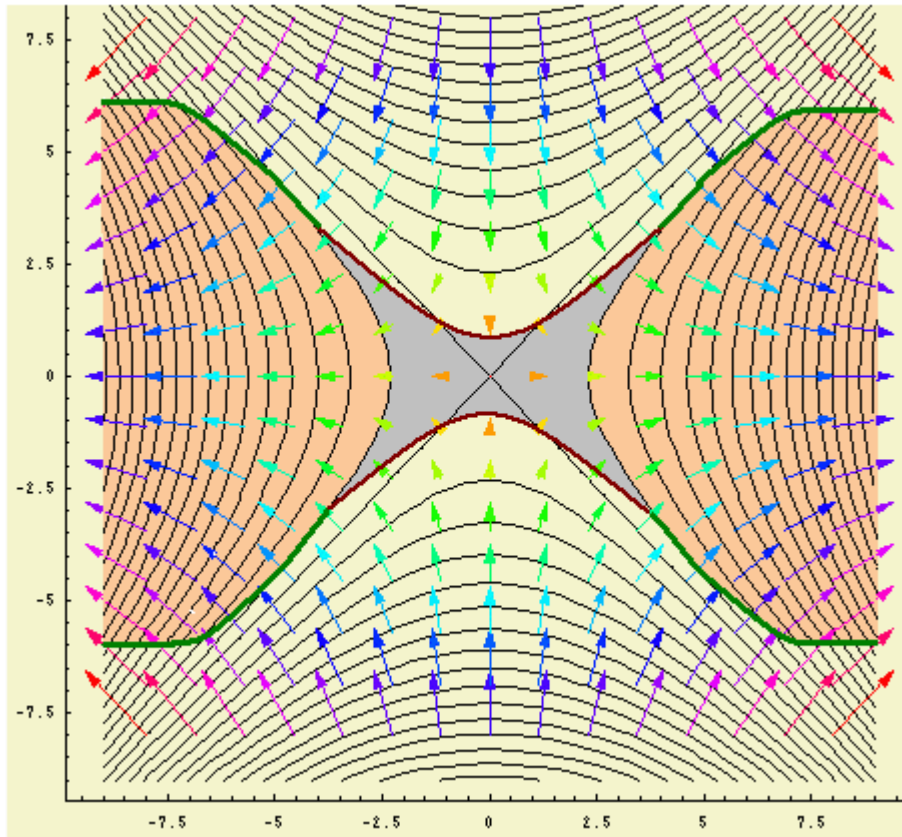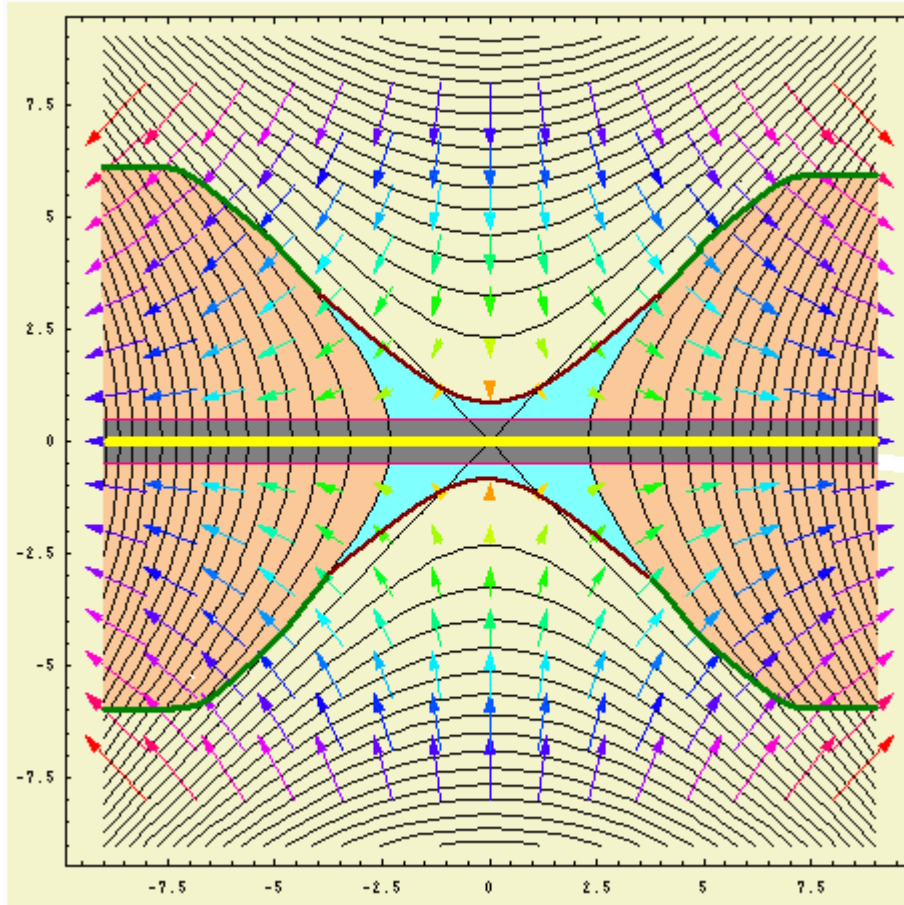# HANDLEBODIES



**Attaching a 1 – handle to a disk (the disk is colored peach, and the left and right hand ends are supposed to match up, maybe as illustrated but possibly also with a Moebius strip – like twist)**

Everything can be shrunk down vertically to the disk bundle over a circle in the middle of the picture (it is colored gray, with the zero section in yellow and the boundary in pink).

In general, if the lower boundary of a cobordism is a sphere and it has a Morse function with only critical points of index 1, it is a connected sum of such disk bundles, and in the oriented case it is diffeomorphic to a boundary connected sum of products of $S^1$ with $D^{n-1}$.