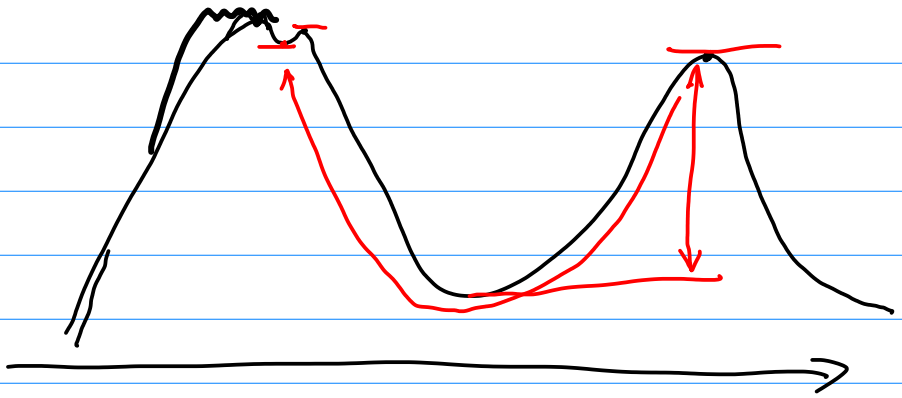
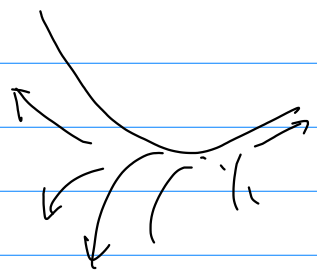
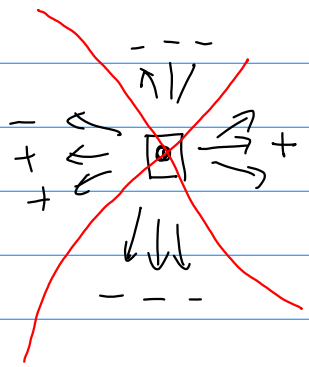
Geographic Prominence

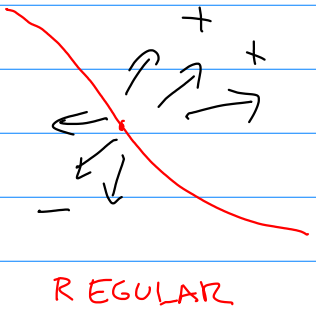


how far do we have to descend from a local max in order to reach a higher elevation?

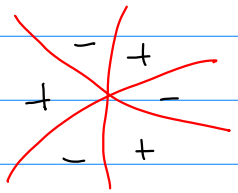


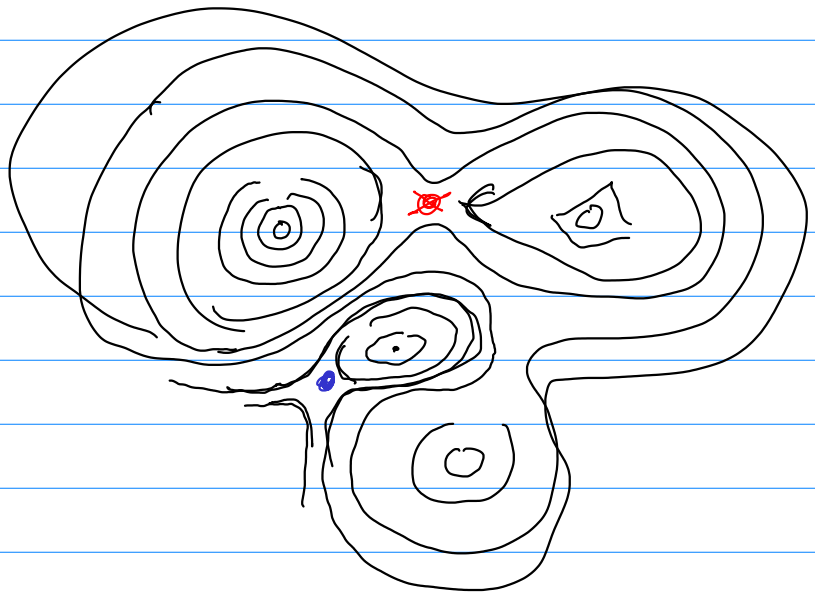


SADDLE

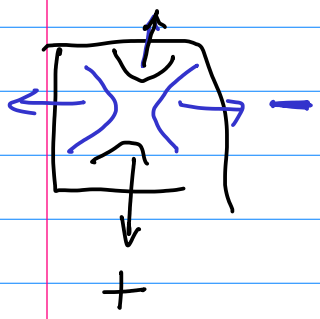


REGULAR

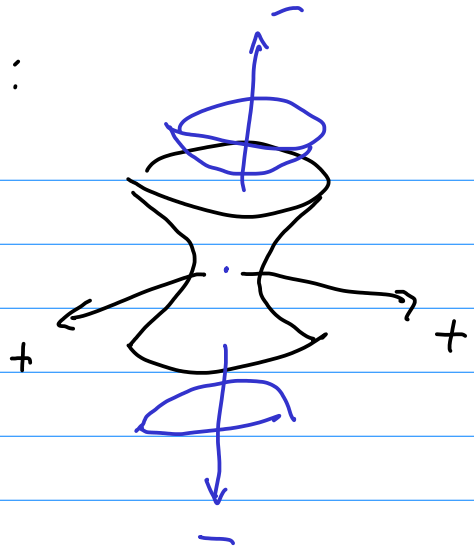


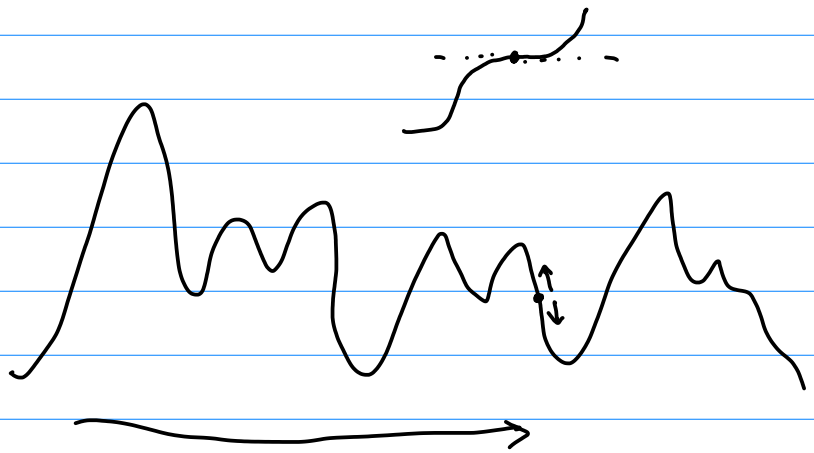


(simple)
SADDLE in 2D



SADDLE in 3D:

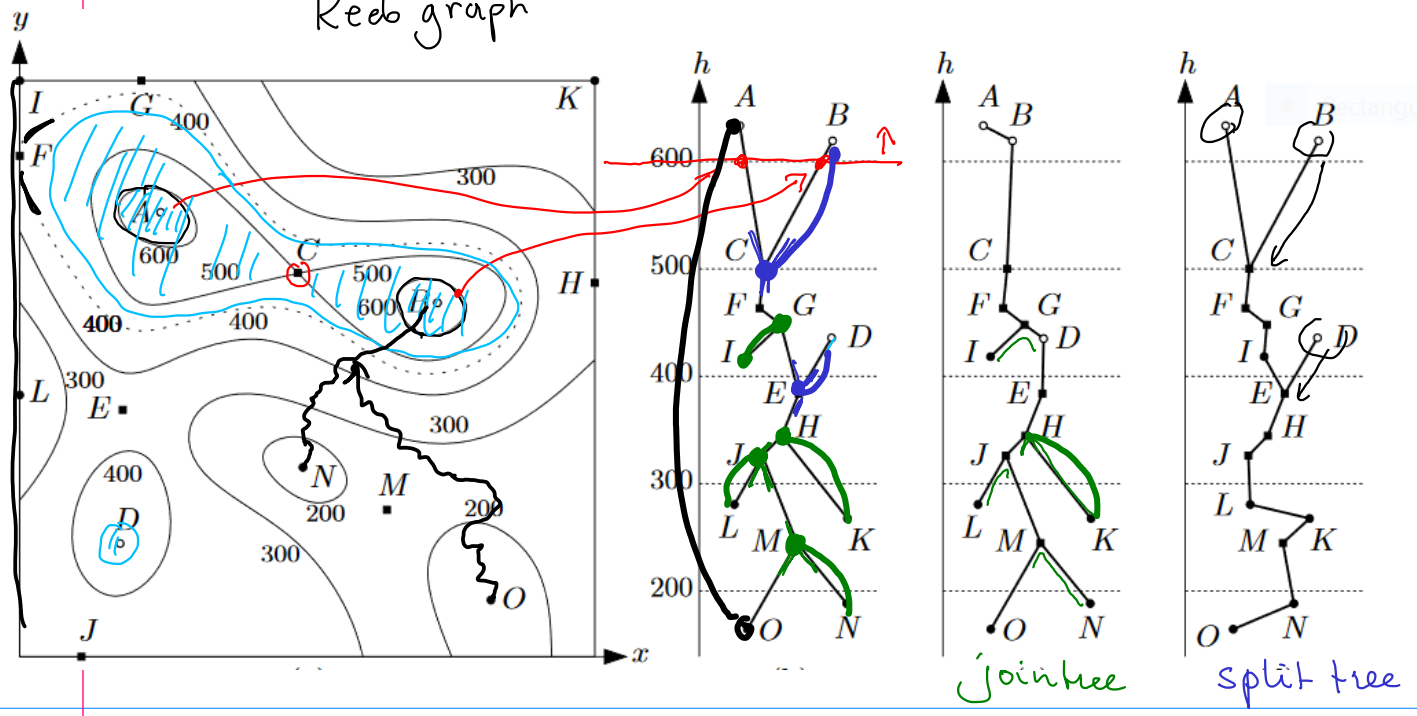




contour tree

Reeb graph

contour = connected component of a level line



[Carr, Snoeyink, Axen 2003]

2 + # saddles = # max + # min (mountaineering equation)

Theorem 5 *The monotone path algorithm computes a contour tree in a triangulated d-dimensional mesh with N cells and t component-critical points in $O(N + t \log t)$ time and $O(N)$ space.*

Computational Geometry 30 (2005) 165–195

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Simple and optimal output-sensitive construction of contour trees using monotone paths

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Benjamin Raichel, B. Seshadri: „Avoiding the Global Sort"
DCG 2017. (error)