These problems from section 1-7 of do Carmo:

- #1
- #3
- #6 a, c

As well as: **1.**

We showed in class that if a curve is convex, then its curvature does not change sign. If a curve is simple and closed, then the converse is also true. That is, if a simple closed plane curve has curvature that doesn't change sign, then the curve is convex. (The proof is an interesting application of the theorem of turning tangents; see do Carmo section 5-7 Proposition 1). Your job here is to show that the hypotheses that the curve be closed and simple are necessary.

a. Find an example of a closed curve with positive signed curvature that isn't convex.

b. Find an example of a simple curve with positive signed curvature that isn't convex.