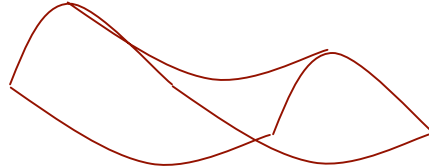


## Assignment 1: Due Monday Jan 21st

---

1. Can you tile a flat surface with hexagons ? A curved surface ? Discuss the tilings of spheres with regular polygons. How would you describe the molecule  $C_{60}$  ?

2. What about a tiling a saddle:



3. What does the tiling of saddle points have to do with certain junctions in carbon nanotubes ?

4. Solids are sometimes characterized by their possessing a shear modulus (they resist shear). When a liquid transforms to a glass, what measurement do you think would characterize the change ?

5. Look at the literature on silicate glasses and distinguish glass formers from glass modifiers.

6.  $PbO$  is added to glass to increase the refractive index (lead "crystal"). Is  $PbO$  a glass former or a glass modifier.