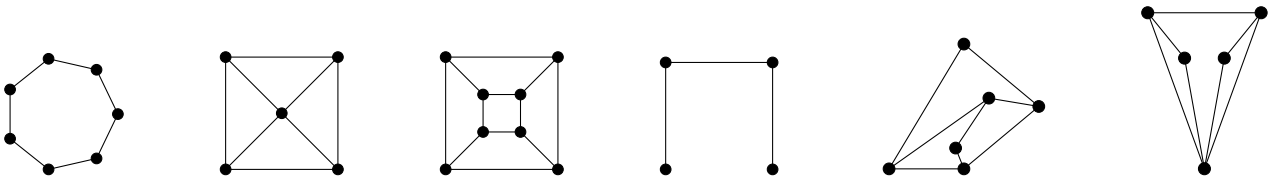
M314 REVIEW EXERCISES 12.04.17

You're encouraged to discuss these problems with other students in the class.

Dictionary:

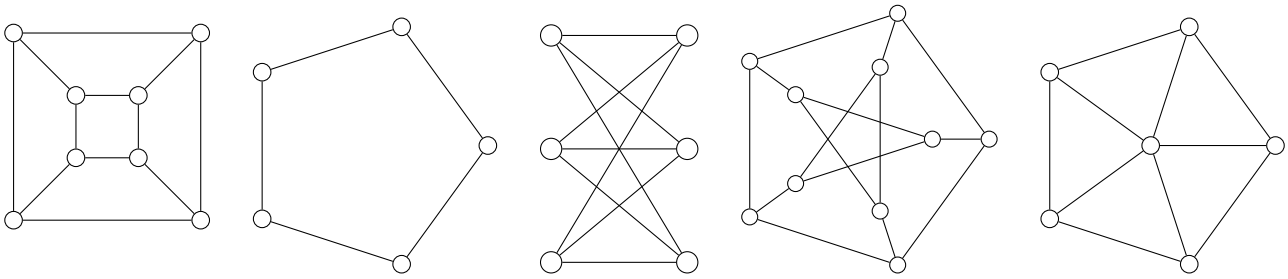
1. Are these graphs planar? How can you draw them without any of the edges crossing?

2. For each of these graphs:
   - Enumerate the faces.
   - Find the sum of degrees of the faces.
   - If v is the number of vertices, e the number of edges and f the number of faces, find $v - e + f$.



3. Find a graph that satisfies $3v \geq 6 + e$, but is still not planar.

4. Find a 3-colouring of each of these graphs.



5. If you weren't able to find a 3-colouring of any of these, prove that it is impossible.