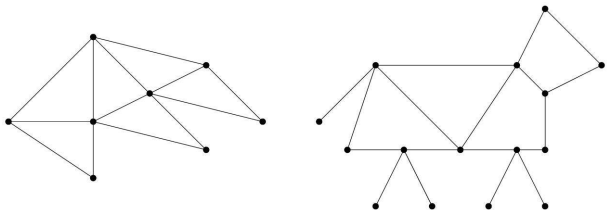
7. (*20 points*) Let G be a planar graph drawn on a plane with no edge crossing. If all the vertices of G lie on the unbounded face in this case, then G is *outerplanar*. The following are two examples of outerplanar graphs.



(a) Give an example of a planar graph that is not outerplanar. [**2 marks**]

(b) Prove that any outerplanar graph is 3-colorable. [**8 marks**]

(c) Suppose that G has $n \geq 2$ vertices and m edges. Determine the maximum value of m and prove your claim. [**10 marks**]