Riddle 16

Suppose that we colour a graph's edges in scarlet. And then decide to depict any two vertices not related by a scarlet edge as related instead by an emerald edge. Then a graph is *scarlet emerald* if its scarlet edges form the same graph as its emerald edges do.
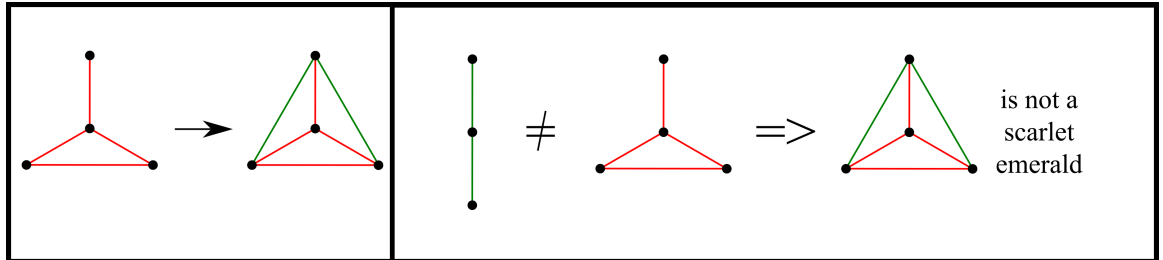

Figure 1:

Prove that it is not possible for a planar scarlet emerald to have ≥ 10 vertices. Find a planar scarlet emerald with 8 vertices. Find any kind of scarlet emerald with 9 vertices.

+ Find a scarlet emerald with 9 vertices and crossing number 1. Can you find a nonplanar scarlet emerald with 8 vertices? Can you find a planar scarlet emerald with 9 vertices?