Notes

9 mars, 2015

7.1 genus of a graph

last chapter we discussed “how far” from planar a graph was. we used the crossing #

in the same vein, but more useful is the genus of a graph. we know that $K_{3,3}$ cannot be embedded on the plane. what about on a donut (torus)?

recall that $\mathrm{cr}(K_5) = 1$.

Now we can “mold” the torus into figure 7.5 on page 271.

so handles can get around crossings.

a sphere with k handles is called a surface with genus k. the book calls it S_k. think a k holed torus.

an easier way:

think of the torus as a plane rolled up into a tube, with edges connected. now we associated opposite edges. use arrows or something to show this

with this interpretation

thrm

if G is connected with $|G| = n, |E(G)| = m$ and G is embedded minimally with r regions, then we have the $n - m + 2 = 2 - 2\gamma(G)$ where $\gamma(G)$ =minimal genus

like before we get a bound right away:

if G is a connected graph with $|G| \geq 3$ then $\gamma(G) \geq \frac{m}{6} - \frac{n}{2} + 1$

Homework

2,8,11