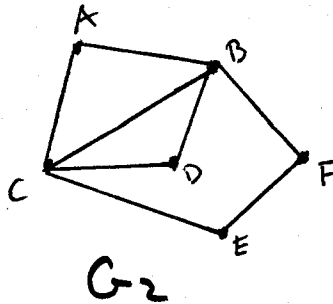
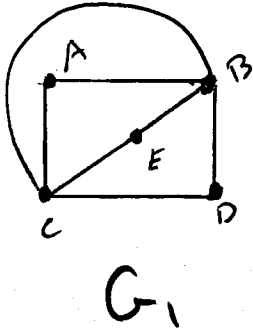


Work carefully and neatly. You must show all relevant work! You may receive no credit if there is insufficient work.

[3pts] 1. Are the following two graphs homeomorphic? Justify your answer

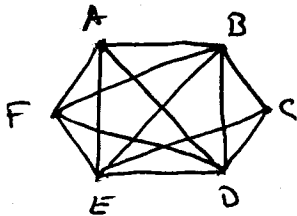


Yes

Remove vertices
E + F from G_2
(and swing edge
over the top)

Remove vertex E
from G_1

[3pts] 2. Determine if the following graph is planar. Justify your answer.



No!

The vertices A, B, D, E, F
with all edges is K_5
So by Kuratowski, graph
is not planar

[4pts] 3. Use Euler's formula to show that a tree with n vertices has $n - 1$ edges.

Any tree is planar with 1 region

Euler's formula says

$$V - E + R = 2$$

If $V = n$, $R = 1$. So we have

$$n - E + 1 = 2 \quad \text{or} \quad n + 1 - 2 = E$$

$$\text{or } E = n - 1$$