Real Quiz 5

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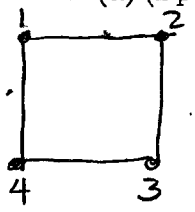
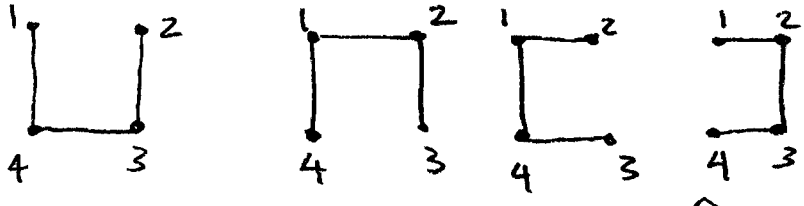
1. (a) (2 point): Draw all the spannng trees of the cycle gtaph C_4, whose edges are $\{\{1,2\},\{2,3\},\{3,4\},\{1,4\}\}$.

G: 

spannig trees: 

(b) (2 point): How many spanning trees does the cycle graph C_n have? EXPLAIN!

n trees because for each spanning tree you are removing an edge from the Cn and since Cn has n edges → n spanning trees

2. (a) (4 points) Using the known fact that a tree has at least ~~one endpoint~~ 2 vertices, prove that it must have at least two endpoint.

A tree has at most n-1 edges so deg sum has at most 2(n-1) edges. 2(n-2)

By contradiction:

if the tree has all vertices with deg ≥ 2 then the sum of all degrees is 2n which contradicts the earlier statement of at most 2(n-1)

And if a tree has only 1 leaf that means you have 2(n-1)+2 → you'll have a cycle.

2 * 2 + 2 + 1

4 + 1 = 8