Math 55 - Section
Homework 11
Thursday, December 8, 2016

1, 2, 3, 4, 5

1 A graph is *outerplanar* if it has an embedding in the plane in which all of its vertices appear on the infinite external face. Show that in an outerplanar graph with $n \geq 3$ vertices and m edges, $m \leq 2n - 3$.

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2 Show that K_4 is not outerplanar.

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3 Show that $K_{2,3}$ is not outerplanar.

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4 Show that a planar graph has a vertex with degree at most 5.

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5 A *maximal planar* graph is a planar graph to which no edge may be added without making it non-planar. Show that a maximal planar graph has at least 4 vertices with degree at most 5.

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