Department of Mathematics
Carnegie Mellon University

21-484 Applied Graph Theory

Test 2

Name:______________________________

Problem	Points	Score
1	50	
2	50	
Total	100	

Q1 (50 points)
Let G be a plane graph. Show that the faces of G can be 2-coloured so that no faces with a common edge are of the same colour if and only if G has no odd vertices. [Hint: for the if case remove a cycle and use induction.]

Q2 (50 points)
$G = (V, E)$ is a graph with an even number of vertices. It has no perfect matching, but $G + e$ has a perfect matching, for all $e \notin E$. What can be said about the structure of G.