MATH 523 HW 3.

**Question 1.** Check the Boolean circuit below. Draw a graph where the maximum independent sets represent an assignment of the circuit’s inputs that makes the output true. (Boolean circuit → Boolean formula → CNF → 3SAT → graph)

![Boolean Circuit Diagram]

**Question 2.** Prove that TSP is harder (or at least as hard as) than the Hamilton Cycle Problem, HCP. (HCP: An algorithm which finds a Hamilton cycle in the given graph or concludes that the graph is not Hamiltonian.)

a, We know that there is a 1.5 approximation for TSP. What is your interpretation of this for the Hamilton cycle problem?

b, Can you find a better than 1.5 approximation for a TSP problem which comes from a HCP?

**Question 3.** Construct a graph where Hamilton cycles represent minimum vertex covers in the graph below.

![Graph Diagram]

Due date: Nov 2, Thursday in class