Math exam Part 2

1. Simplify $\neg(P \rightarrow Q)$

2. For all graphs G if G is Planar then the chromatic number of G is at most 4
   a. Direct proof

   b. Proof by Contrapositive

   c. Proof by Contradiction

   d. Proof by minimal criminal

3. a. Complete Truth Table E -> (P V T)

b. Use truth table to prove k4 is not a counter example.

c. Write a counter example

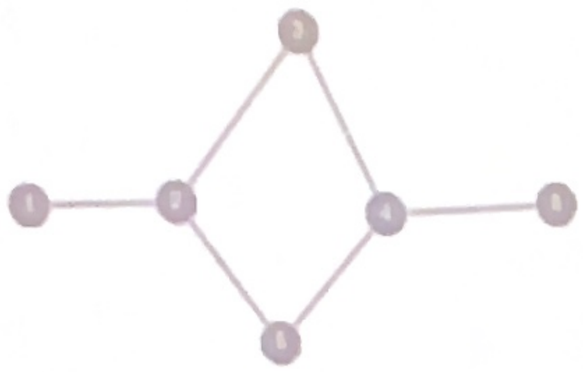
4. Let G = (V, E)

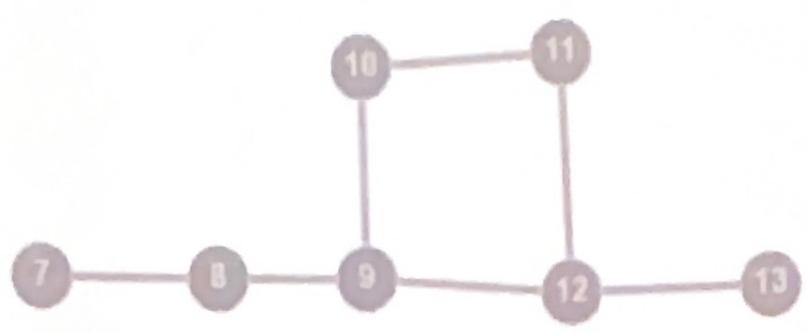
V = {A, B, C, D, E, F, G}

E = {(a, b), (a, d), (b, c), (b, e), (c, d), (e, c), (f, g)}

a. Draw the graph

b. Which graph is Isomorphic to the graph you drew?





5.

a. I have a connected graph with 5 vertices of degree 4. How many edges are there and explain how you know?

b. Prove the graph can't be planar