CS 173, Fall 18 Examlet 6, Part A

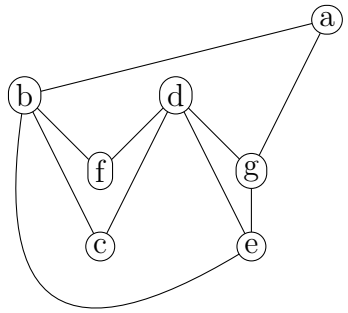
Name:_____

NetID:_____ **Lecture: B**

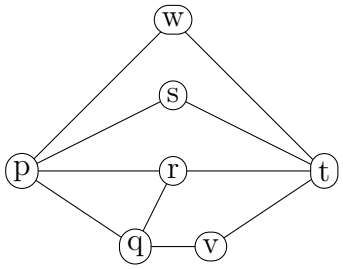
Discussion: Friday 11 12 1 2 3 4

1. (10 points) Are graphs X and Y (below) isomorphic? Justify your answer.

Graph X



Graph Y



Solution: Yes. We can map the nodes as follows:

f(b) = t, f(d) = p, f(f) = w, f(c) = s,, f(e) = r, f(g) = q), f(a) = v.

2. (5 points) The complete graph K_8 contains 8 nodes. How many edges does it have?

Solution: $\frac{8 \cdot 7}{2} = 28$

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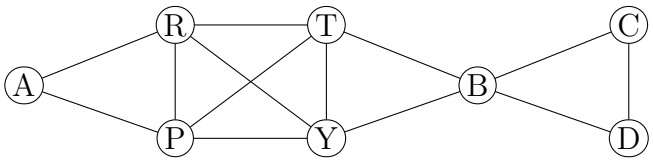
1. (10 points) How many isomorphisms are there from G (below) to itself? Justify your answer and/or show your work clearly .



Solution: A and B must map onto themselves. R and P can swap (2 choices) T and Y can swap independently of R and P (2 choices). And C can also swap with D. So there are 8 choices total.

2. (5 points) Complete this statement of the Handshaking Theorem.

   For any graph G with set of nodes V and set of edges E, ...

   Solution: The sum of the degrees of all the nodes is equal to twice the number of edges.