

Names: _____

PantherIDs: _____

Worksheet 1-20 - Graph Theory

1. (a) Sketch the complete bipartite graph $K_{3,4}$.
- (b) What is the order and what is the size of K_{p_1,p_2} ?
- (c) When is K_{p_1,p_2} a regular graph? Recall that a graph is called *regular* if all its vertices have the same degree.
- (d) Describe the complement of $K_{3,4}$, $\overline{K_{3,4}}$, in terms of familiar graphs.

2. (a) Are the graphs $K_{3,3}$ and CL_3 isomorphic? Justify.
- (b) Are the graphs $K_{3,3}$ and ML_3 isomorphic? Justify.

- 3.** (a) Show that in any graph of order p , there is no open path of length larger than $p - 1$.
(b) Show that in any graph of order p , there is no cycle of length larger than p .
(c) Do the statements in parts (a) and (b) remain true if "graph" is replaced by "general graph"?

4. (a) Sketch the graphs $circ(7 : \{1, 2\})$ and $circ(7 : \{1, 3\})$.

(b) Are the graphs in part (a) isomorphic? If yes, describe an isomorphism, if not, find a reason why they are not isomorphic.

Hint: It may be easier to consider the complements.