Graph Theory Exercises
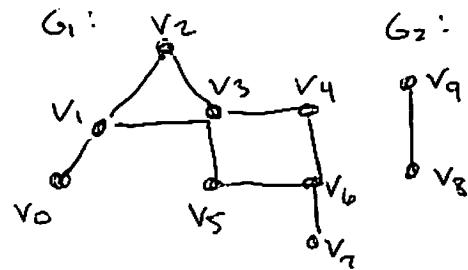
① Look up definition of a connected graph.
Draw a connected graph and a graph that is not connected.

② Look up definition of a complete graph.
Draw K_3, K_4, K_5.

Consider the following graph G:

③ Determine
$\deg(v_0)$
$\deg(v_3)$
$\deg(v_5)$
$\deg(v_9)$

G_1: with vertices v_1, v_2, v_3, v_4, v_0, v_5, v_6, v_7

G_2: with vertices v_9, v_8

④ List the vertices in a path from v_0 to v_7

⑤ How many cycles does this graph contain?
List the vertices in any cycle you find.

⑥ Draw 3 different (non-isomorphic) subgraphs of G

⑦ What is the chromatic number of this graph?

⑧ Look at Figure 12.16 in your text.
Does this graph have an Euler tour? (Euler cycle).
Why or why not?

⑨ What is the Königsberg bridge problem?
Draw it as a graph. Is there a solution to this problem?
Why or why not?

⑩ What is a Hamiltonian cycle? Draw a graph that has a
Hamiltonian cycle and a graph that does not.
Answer the question posed in Figure 12.17 in your text.