MACM 201 Homework 2 (Quiz Sep. 19)

Textbook problems:

Section	Question
8.1	6
8.1	16
8.1	20
8.2	2(a)
8.2	4
8.3	6
8.3	14
11.1	2
11.1	6
11.1	14
11.2	8

Instructor question(s):

1. Define G_n to be a graph with vertices the set of all strings of length n over the alphabet $\{0, 1\}$, and edges all pairs $\{v, w\}$ where v and w differ in exactly two positions.

   (a) Draw G_1, G_2, G_3

   (b) Prove that every vertex with an even number of 1s has a path to $000\ldots0$ and every vertex with an odd number of 1's has a path to $100\ldots0$.

   (c) Prove that $\kappa(G_n) = 2$ for every $n \geq 1$.

   (d) Determine (with proof) how many vertices and edges G_n has.

2. Define H_n to be a graph with vertices the set of all strings of length n over the alphabet $\{0, 1, 2\}$, and edges all pairs $\{v, w\}$ where v and w differ in exactly two positions.

   (a) Draw H_1, H_2.

   (b) For every $n \geq 1$ determine (and prove) the value of $\kappa(H_n)$.

   (c) Determine (with proof) how many vertices and edges H_n has.