Honors Discrete Mathematics

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Autumn Quarter, 2017

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   Prove all of your answers.  If you work with others put their
names clearly at the top of the assignment.  Everyone must turn
in their own independently written solutions.  Shopping for solutions
on the Internet is strongly discouraged:  if you do it nonetheless,
you *must* cite your source and, as the very least, explain the
solution in your own words.
   Homework is due at the beginning of class unless submitted by
e-mail as a PDF file prepared from a TeX source.  Electronic submissions
conforming to these standards (no scans please!)  are encouraged
and accepted until Wednesday midnight at the Canvas.
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Homework 8, due November 29

1. Let $a, b \geq 2$ be integers. Consider the graph $G = (V, E)$, where $V = \{0, 1, \ldots, a-1\}$ and $E = \{(x, x+b \mod a) \mid x \in V\}$. How many connected components does G have?

2. Give an example of two simple graphs that:

   (a) have the same degree sequences;

   (b) for any given $r \geq 2$ have the same number of copies of K_r;

   (c) for any given $\ell \geq 3$ have the same number of induced copies of C_ℓ

   but nonetheless are not isomorphic to each other.