# 24 Sept 2014

Math 181

## Exam 1 Practice Questions

Tips:

- A 100-point exam equates to having about five minutes for each 10-point problem.

- We'll start right at 10:00 and end at exactly 10:50, so be on time.

- If I ask you to state a definition or a theorem, you are allowed to use other definitions that you know.
  For example, when stating the Euler Circuit Theorem, you do not need to state the definition of "Euler circuit".
  If I ask you for the definition of "chromatic number", then you do not need to define a proper vertex coloring.

- One exam counts more than all homework combined, and has the same weight as all of your quizzes.

- I'll hold office hours from 9-11am tomorrow morning; please stop by if you need more practice.

- Hopefully you're working lots of practice problems. If you get stuck, ask for help!

Practice Problems:

1. Give an Eulerization of the following graph.
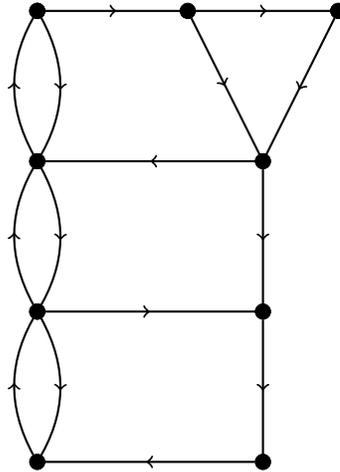
2. Determine the chromatic number of the following graph. (Moser Spindle)
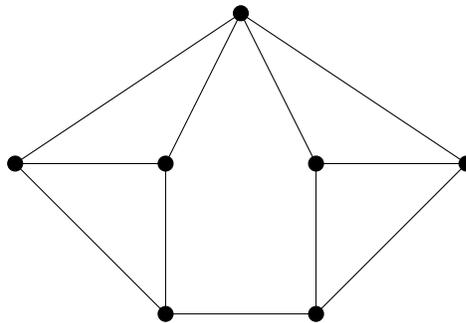
3. Use Ramsey's Theorem to give an upper bound on $R(3, 8)$.

4. Prove that if seven integers are chosen from $\{1, 2, \ldots, 12\}$, then some pair sums to 12.

5. Twenty people in a room take part in handshakes, and no one shakes the same person's hand more than once. Prove that two people took part in the same number of handshakes.

6. On a circle with a 10 cm circumference, I choose 12 points on the perimeter. Prove that two of those points must be less than 1 cm apart.

7. Is everyone in the room at least 16 years old? Prove that two of us must be the same age. (Hint: I'm 27)

8. Is anyone younger than 18 or older than 22? Prove that three students in this room must be the same age.