Math 353 Test 1

January 25, 2013   Name: _____

1. Prove by induction that for all $n \in \mathbb{N}$ the sequence

$$n, n, n-1, n-1, \ldots, 3, 3, 2, 2, 1, 1$$

is graphic. Arrange your steps as outlined below, and include all quantifiers and necessary logical words in your argument.

Base case: When $n = 1$, ...

Inductive hypothesis: Assume that...

Inductive step: We will show that...

(now show it)

2. Argue that each edge of K_5 is part of exactly fifteen cycles. Make sure that your counting argument is clear (don't just list/draw the cycles).