

HOMEWORK #5
Math 6014

Problem 8. Let H be the graph on four vertices consisting of a triangle and a vertex of degree one adjacent to one of the vertices of the triangle. Prove that if $pn \rightarrow 0$ as $n \rightarrow \infty$, then almost no graph in $\mathcal{G}(n, p)$ has a subgraph isomorphic to H , and that if $pn \rightarrow \infty$ as $n \rightarrow \infty$, then almost every graph in $\mathcal{G}(n, p)$ has a subgraph isomorphic to H . You may not use a theorem that was not proved in class.

Instructions: You are only allowed to use your own notes, class handouts and the designated textbook. No collaboration. Clarity of exposition, ease of expression, mathematical elegance and overall physical appearance will all be factors in grading. Please start your work on a new page, and sign and attach this sheet. If submitting a pdf file electronically, include the appropriate statement in the body of the message. This assignment is due before 3:05PM, Wednesday, December 3, 2008.

Format: Please type your solution on one-sided letter size paper in 10pt font or larger. Figures and mathematical formulae may be drawn by hand in black ink. Do not fold pages or bend corners.

NAME (please print):

GTid#:

Please check the box that applies.

The attached paper represents my own work. Since the posting of this homework I have worked on my own, have not consulted with other persons, and have not used sources other than those listed above. I understand that making a false statement is a violation of the Georgia Tech Honor Code.

I have consulted with the following persons and used the following sources:

Signature:

Date: