Graph Theory

MAD 5305 (MAT 5932)
Fall 1992
Office Hours: MWF 12:45 - 1:15 or by appointment

Instructor: Bellenot
Office: 002-B Love

Text: Chartrand & Lesniak, Graphs and Digraphs, 2nd ed., Wadsworth & Brooks/Cole, 1986.

Coverage: Parts of most the chapters (as time allows).

Grades: The easy-going 85%, 70%, 55% and 40% cut-offs.

Project: A 3-5 page paper on a pre-approved graph theoretical topic. The project is due on Friday 20 November. If time allows, projects will be presented in class. Worth **15-20%** of your grade.

Final: This is "in class" and "closed book" test worth **20%** of your grade. The final will be given Monday 7 December, 10am - 12noon.

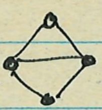
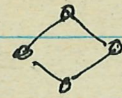
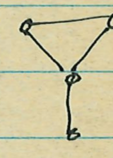
Homework: The remaining **65-70%** of your grade will be determined by homework problems. Some (but perhaps not all) homework problems will be graded on a ten point scale. Only the top 90% of your graded homework is used to compute your homework average. Generally three homework problems will be assigned each Monday and due the following Monday.

Homework Rules:

Must be your **OWN** work!
Must be neat and in clear English.
Must be on time -- late homework is not accepted.
Must be on 8 1/2 by 11 paper.
Must be written in ink.
Must use only one side of each page.
Multiple pages must be stapled together.

GRAPH THEORY FINAL
7 DEC 1992

1. Reconstruct G if $p(G) = 5$ and

$G_1 \cong$  $G_2 \cong G_3 \cong$  $G_4 \cong G_5 \cong$ 

2. If $\delta(G) \geq 2$, then G has a cycle of length $\geq \delta(G) + 1$.

3. If G is n-connected for $n \geq 2$, then $L(G)$ [its line graph] is n-connected.

4 If G is connected, then

$$\kappa(G) + 1 \leq \kappa(G \times K_2) \leq 2\kappa(G)$$

5. If T is a tree with even diameter, then there is exactly one vertex in the center of T.

6. If T is a non-trivial tree, the following are equivalent
   A. $\operatorname{diam} T \geq 3$
   B. T is not isomorphic to $K_{1,p-1}$
   C. $\overline{T}$ is connected
   D. T contains distinct vertices v_1, v_2, u_1, u_2 with both $v_i u_i \in E(T)$ and $\deg v_i = 1$ for $i = 1, 2$

7. If T is a non-trivial tree not isomorphic to $K_{1,p-1}$ then T is isomorphic to a subgraph of $\overline{T}$.