CS 0368-4246: Combinatorial Methods in Algorithms (Spring 2025)    March 17, 2025

## Lecture 1: Extremal Graph Theory and Finding Short Cycles

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# Homework Questions

1. (a) Count the number of triangles in a graph in $O(n^\omega)$ time.

   (b) Decide whether a graph contains a triangle in $O(m^{\frac{2\omega}{1+\omega}})$ time.

2. Generalize the proof of Mantel's theorem to prove the direction of Turan's theorem we did not show in class.