

Math 5405 - Fall 2007

Homework # 5

Due October 4, 2007

Directions: Be sure to show all work!!

1.

a. Let P be the Petersen graph. Determine $\alpha(P)$, $\alpha'(P)$, $\beta(P)$, and $\beta'(P)$.

b. Let Q_3 be the 3-dimensional cube. Determine $\alpha(Q_3)$, $\alpha'(Q_3)$, $\beta(Q_3)$, and $\beta'(Q_3)$.

2. Prove that if G is a graph of order n and maximum degree Δ , then

$$\alpha(G) \geq \frac{n}{\Delta + 1}.$$

3. Let G be a bipartite graph with parts X and Y , and let δ_X be the minimum degree of the vertices in X , and Δ_Y be the maximum degree of vertices in Y . Show that if $\delta_X \geq \Delta_Y$ then G contains a matching which saturates X .

4. 3.1.21

5. 3.3.10

EXTRA: 3.1.26