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HW Four, MTH 418, Spring 2016

Ayman Badawi

QUESTION 1. (i) Let $n \geq 4$ Find $\kappa(C_n)$ and $\kappa'(C_n)$.

(ii) Let H be a 2-regular connected graph with n vertices where $n \geq 3$. In at most 6 lines, convince me that $H = C_n$.

(iii) Let H be a 4-regular connected graph and assume that $\kappa(H) = 4$. In one line, find $\kappa'(H)$? and verify your answer.

(iv) Let $H = Q_k$ where $k \geq 3$. What is $\kappa(H)$ and $\kappa'(H)$? Convince me that your claim is correct, in few lines, by showing me how you choose your cut-edge set and cut-vertex set for the graphs K_3, K_4

(v) Let H be a connected graph such that $\kappa(H) = 21$. Convince me that $girth(H) < \infty$.

(vi) Give me an example of an Eulerian graph such that $\kappa'(H) = 6$.

(vii) Give me an example of an Eulerian graph that is not an Eulerian circuit but $\kappa^(H) = 3$.

(viii) Let H and D be Hamiltonian graphs such that each is of order 3. Convince me that $H \times D$ is Hamiltonian by constructing a Hamiltonian cycle of $H \times D$. Is there anything special about 3?

(ix) Let H be an 8-regular connected graph of order n where n is odd. Find $\chi'(H)$. Convince me that your claim is correct.

(x) Give me an example of complete bipartite graph that has a maximum matching set but it has no perfect matching set.

(xi) Give me an example of complete bipartite graph that has perfect matching set.

(xii) Construct a perfect matching set for Q_3.

Due date: Sunday April 24 ,2016 Faculty information

Ayman Badawi, Department of Mathematics & Statistics, American University of Sharjah, P.O. Box 26666, Sharjah, United Arab Emirates.
E-mail: abadawi@aus.edu, www.ayman-badawi.com