1. Let $G$ be a bipartite graph with bipartition $X, Y$ in which every vertex in $G$ has degree $k$. Prove that $|X| = |Y|$.

2. Prove that an edge $e$ is contained in every spanning tree for a connected graph $G$ if and only if removal of $e$ disconnects $G$.

3. In problem 2 of homework 13t you computed
   A. $\gcd(20, 25)$.
   B. $\gcd(0, 10)$.
   C. $\gcd(123, -123)$.
   D. $\gcd(54321, 50)$.
   E. $\gcd(1739, 29341)$.

   Now, for each pair of integers $a$ and $b$, above, find integers $x$ and $y$ such that $ax + by = \gcd(a, b)$. Show all your work.

4. Suppose that $a$ and $b$ are relatively prime and that $a|c$ and $b|c$. Prove that $(ab)|c$. 