University of Washington
Department of Computer Science and Engineering
CSE 321, Winter 2008

March 3, 2008

Homework 9, Due Thursday, March 13, 2008

Problem 1:
Section 6.4, Problem 6. (5th edition: section 5.3, problem 6)

Problem 2:
Section 6.4, Problem 10. (5th edition: section 5.3, problem 10)

Problem 3:
Section 8.1, Problem 4. (5th edition: section 7.1, problem 4)

Problem 4:
Section 8.1, Problem 34 a, b, c, d. (5th edition: section 7.1, problem 34 a, b, c, d)

Problem 5:
Section 8.3, Problem 10 a, b, c. (5th edition: section 7.3, problem 10 a, b, c)

Problem 6:
Section 8.3, Problem 14 a, c, e. (5th edition: section 7.3, problem 14 a, c, e)

Problem 7:
For the relation $R = \{(b,c),(b,e),(c,e),(d,a),(e,b),(e,c)\}$ on $\{a,b,c,d,e\}$, draw the following relations in directed graph form:

a) R

b) The symmetric closure of R

c) The transitive closure of R

Problem 8:
Let R be the relation on ordered pairs of positive integers such that $((a,b),(c,d)) \in R$ if and only if $ad = bc$. Show that R is an equivalence relation. (Note that this is a relation on a set of ordered pairs. Think of the ordered pairs as fractions: $(\frac{a}{b}, \frac{c}{d}) \in R$ if and only if $ad = bc$.)

Extra Credit 9:
For undirected simple graphs, prove that if G is disconnected, then $\overline{G}$, the complement of G, is connected. ($\overline{G}$ is made up of the edges that are absent from G.)

Extra Credit 10:
Suppose that G is an unidrected graph and every vertex has degree at least d for some $d > 2$. Prove that G must contain a (simple) cycle of length at least $d + 1$.