CS 171
Homework Assignment 13t

Given: April 17, 2012 **Due:** April 19, 2012

This assignment is due by the end of the class on the due date. Unless all problems carry equal weight, the point value of each problem is shown in [ ]. To receive full credit all your answers should be carefully justified. Each solution must be the student's own work. Assistance should be sought or accepted only from the course staff. Any violation of this rule will be dealt with harshly.

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1. Prove that if a graph is bipartite then it has no odd cycles.

2. Calculate the following showing all your work.

a. $\gcd(20, 25)$.
b. $\gcd(0, 10)$.
c. $\gcd(123, -123)$.
d. $\gcd(54321, 50)$.
e. $\gcd(1739, 29341)$.

3. Suppose G is a graph with 100 vertices. One way to determine whether G is 3-colorable is to examine all possible 3-colorings of G. If a computer can check 1 million colorings per second, about how long would it take to check all possible 3-colorings?

4. Answer the following questions. Show all your work.

a. Find the value of $\log_5 \frac{(125)(625)}{25}$.

b. What is the value of $\log_3 27\sqrt[4]{9}\sqrt[3]{9}$

c. Express $2 + \sqrt{2} + \frac{1}{2+\sqrt{2}} + \frac{1}{\sqrt{2}-2}$ in its simplest form.

d. Simplify the expression $81^{-(2^{-2})}$.

e. Find $\log_{\sqrt{3}} \sqrt[3]{9}$.

f. Find x if $2^{16^x} = 16^{2^x}$.

g. Solve the equation $\log_{2x} 216 = x$, where x is real.

h. Evaluate $\log_6 2 + \log_6 3$.

i. Suppose A and B are positive real numbers for which $\log_A B = \log_B A$. If neither A nor B is 1 and $A \neq B$, find the value of AB.