CISC-102 WINTER 2016

HOMEWORK 7

Please work on these problems and be prepared to share your solutions with classmates in class next Friday. Assignments will **not** be collected for grading.

Readings

Read sections 11.7, 11.8 (only up to the remarks after Theorem 11.21, you may omit the rest of the section) 5.1,5.2,5.3,5.4,5.5 of *Schaum's Outline of Discrete Mathematics.*

Read section 1.7, 1.8, of *Discrete Mathematics Elementary and Beyond.*

Problems

(1) Let a = $2^2 * 3 * 7^2$ and b = $2 * 3^2 * 7$

   (a) Find g = gcd(a,b). Show how the prime factorization is helpful for finding gcd(a,b)

   (b) Find lcm(a,b). Show how the prime factorization is helpful for finding lcm(a,b)

(2) Let a, b, m be positive integers, such that $a \equiv b \mod m$. Show that this implies that there exists an integer q so that $a = b + qm$. For example: Suppose $a = 4, b = 8$ and $m = 8$. Then this implies that there is an integer q such that $4 = 8 + q2$. In this example it is easy to see that $q = -2$.

(3) A store selling menswear has, 3 kinds of jackets, 7 kinds of shirts, and 5 kinds of pants. How many choices are there for a single item? How many choices are there for one of each kind of clothing item.

(4) Suppose we have 9 signal flags that are hung on a vertical flag pole, such that there are 4 identical red flags, 2 identical blue flags, and 3 identical green flags. How many different signals can be made using all 9 flags.

(5) How many different strings can you make using the letters TIMBITS?

(6) A restaurant has 6 different deserts on the menu. How many ways are there to choose 1 desert? 2 different deserts? 3 different deserts?