Class Problem
Math 2513
Wednesday, June 22

PROBLEM 1. Evaluate each of the following: (a) 294 **mod** 7, and (b) 294 **mod** 6.

PROBLEM 2. Find the prime factorizations of 140 and of 294.

PROBLEM 3. Determine the greatest common divisor of 294 and 140.

REMINDER:
If a is an integer and d is a positive integer then the Division Algorithm guarantees that there are integers q and r, with $0 \leq r < d$ such that $a = dq + r$. Then a **mod** d is defined to equal r.

ANSWERS:
1. (a) 294 **mod** 7 $= 0$, and (b) 294 **mod** 6 $= 0$. These results follow since we can write (a) $294 = 7 \cdot 42 + 0$ and (b) $294 = 6 \cdot 48 + 0$.
2. The prime factorizations are $140 = 2^2 5^1 7^1$ and $294 = 2^1 3^1 7^2$.
3. $\gcd(294, 140) = 2^{\min(2,1)} 3^{\min(0,1)} 5^{\min(1,0)} 7^{\min(1,2)} = 2^1 3^0 5^0 7^1 = 14$.