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 $140 = 2^25^17^1$ and $294 = 2^13^17^2$.
3. $\gcd(294, 140) = 2^{\min(2,1)}5^{\min(0,1)}7^{\min(1,2)} = 2^13^05^07^1 = 14$. 