TYPE YOUR NAME HERE
HW 20: 4.1 - 4.6
M328K
April 5th, 2012

4.1 Exercise. *For $i = 0, 1, 2, 3, 4, 5,$ and 6, find the number in the canonical complete residue system to which 2^i is congruent modulo 7. In other words, compute $2^0 \pmod 7, 2^1 \pmod 7, 2^2 \pmod 7, \ldots, 2^6 \pmod 7$.*

Solution. Type your solution here! □

4.2 Theorem. *Let a and n be natural numbers with $(a,n) = 1$. Then $(a^j, n) = 1$ for any natural number j.*

Proof. Type your proof here! □

4.3 Theorem. *Let a, b, and n be integers with $n > 0$ and $(a,n) = 1$. If $a \equiv b \pmod n$, then $(b,n) = 1$.*

Proof. Type your proof here! □

4.4 Theorem. *Let a and n be natural numbers. Then there exist natural numbers i and j, with $i \neq j$, such that $a^i \equiv a^j \pmod n$.*

Proof. Type your proof here! □

4.5 Theorem. *Let a, b, c, and n be integers with $n > 0$. If $ac \equiv bc \pmod n$ and $(c,n) = 1$, then $a \equiv b \pmod n$.*

Proof. Type your proof here! □

4.6 Theorem. *Let a and n be natural numbers with $(a,n) = 1$. Then there exists a natural number k such that $a^k \equiv 1 \pmod n$.*

Proof. Type your proof here! □