**Math 465 - Fall 2019**
**Homework 5**
Due October 7th, 2019

*There are certain things whose number is unknown. If we count them by threes, we have two left over; by fives, we have three left over; and by sevens, two are left over. How many things are there?*
— Sunzi Suanjing, 3rd century AD

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**Turn in:** 5-3.1(a,c) 5-3.4, 6-1.1, 6-1.4 (From the textbook) and the following:

(1) Let $m, n > 1$ be (not necessarily coprime) integers. Prove that the two congruences $x \equiv a \pmod{m}$ and $x \equiv b \pmod{n}$ admit a simultaneous solution if and only if $\gcd(m, n)$ divides $a - b$.