

**Math 465 - Fall 2019**

**Homework 4**

Due **Monday** September 30th, 2019

*How many times can you subtract 7 from 83, and what is left afterwards? You can subtract it as many times as you want and it leaves 76 every time.*

— Unknown

---

**Turn in:** 4-1.1, 4-1.5, 5-2.1 (From the textbook) and the following:

- (1) If  $m, n$  are positive integers and  $m|n$ , show that  $a \equiv b \pmod{n}$  implies that  $a \equiv b \pmod{m}$ , but not necessarily conversely.
- (2) Prove that  $(p - 2)! \equiv 1 \pmod{p}$  for any prime  $p$ .