

Homework 3

1. Sec. 1.6: 14, 18.
2. Suppose a, b, d, x, y are integers. Prove that if d divides a and d divides b then d divides $ax + by$.
3. Let a and b be positive integers with $b > a$. Recall that $b \bmod a$ is equal to the remainder when b is divided by a . For example, $11 \bmod 5 = 1$ while $23 \bmod 20 = 3$. Show that $b \bmod a < b/2$. That is, when b is divided by a , the remainder will always be smaller than $b/2$. (Hint: Consider the case when $a > b/2$ and $a \leq b/2$.)
4. Sec. 1.7: 4
5. Sec. 5.2: 6, 14