

HOMEWORK 18
DISCRETE MATHEMATICS I
DUE 04-11

We call a collection of integers *consecutive* if and only if it is of the form $n, n + 1, n + 2, \dots, n + k$.

(1) Consider the statement:

If a and b are integers, and $a \mid b$, then $a \leq b$.

(a) Provide a counterexample to show that the statement is false.

(b) Make a small change so that the statement becomes true, and prove it.

(2) (a) Find two consecutive positive integers that are prime.

(b) Prove that there is no other possible answer to (a).

(3) (a) Find two consecutive positive integers that are composite.

(b) As in (a), but with three consecutive positive integers.

(c) As in (a), but with four.

(d) Prove that, for any positive integer n , you can find n consecutive integers that are composite.

- **Three** book problems: #3.1.30, 35, 36.