

## Math 8 - Homework #3

Due: April 20, 2009

For exercises 1-3, do the following:

- (a) Rewrite the given proposition as a conditional (if-then) statement.
  - (b) Prove the proposition or give a counterexample.
  - (c) If you prove it, say whether your proof is direct, indirect or by contradiction.
1. The sum of any two odd numbers is even.
  2. The product of any two consecutive integers is even.
  3. For every odd prime number  $p$ , at least one of the numbers  $p + 2$ ,  $p + 4$  is also prime.
  4. Let  $n$  be an integer. Prove that  $n^2$  is even if and only if  $n$  is even.
  5. Prove that 5 is a prime number.
  6. From the text: Section 1.3, Ex. 1)d,e,f; 3; 5)a-d; 6; 7.
  7. (You don't need to turn in this problem, but you should still write down your answers—perhaps on your old assignment.) Look back over your proofs in homework 1. Can you identify propositions? What rules of inference have you used? Are your proofs direct or indirect, or by contradiction?