Math 2001 - Assignment 3

Due September 16, 2015

(1) Are the following statements? If so, determine whether they are true or false.
    (a) Some swans are black.
    (b) Every real number is an even integer.
    (c) If x is an even integer, then $x + 1$ is odd.
    (d) $2x = 1$
(2) [1, Section 2.3]: Exercises 2,4,10
(3) Formulate the negations of the following statements. Are the given statements true?
    (a) 2 is even, and 3 is even.
    (b) $2^n + 1$ is a prime number for every $n \in \mathbb{N}$.
    (c) There exists an even prime.
    (d) If the integer x is a multiple of 6, then x is even.
(4) The following **writing project** is worth 15 points. It will be graded on clarity and correctness and should be typed.
    Write a complete guide to the game Poison for n stones. You should include the following:
    (a) Describe the game.
    (b) State the main result in a few sentences: What is the outcome of the game depending on n (i.e., who will win if both players know what they are doing?).
    (c) What is the optimal strategy?
    (d) Give precise arguments for all your statements.

References

[1] Richard Hammack. The Book of Proof. Creative Commons, 2nd edition, 2013. Available for free: http://www.people.vcu.edu/~rhammack/BookOfProof/