Problem Set 1
CSCE 440/640

Due dates: Electronic submission of .tex and .pdf files of this homework is due on **9/7/2016 before 2:40pm** on ecampus.tamu.edu, a signed paper copy of the pdf file is due on **9/7/2016** at the beginning of class.

Name: (put your name here)

Resources. (All people, books, articles, web pages, etc. that have been consulted when producing your answers to this homework)

On my honor, as an Aggie, I have neither given nor received any unauthorized aid on any portion of the academic work included in this assignment. Furthermore, I have disclosed all resources (people, books, web sites, etc.) that have been used to prepare this homework.

Signature: _____

Important: Read Chapter 1 in our textbook (Kaye, Laflamme, Mosca). Read Chapter 1 and Appendix A in the lecture notes (Quantum Algorithms).

Problem 1. (20 points) Get familiar with LaTeX. Let $a + ib$ be a complex number, where a and b are real numbers and $i^2 = -1$. Nicely typeset how to convert the representation (a, b) to polar coordinates (r, θ). Find out how you can include a helpful graph or picture (tikz is my current personal favorite).

If you need to refresh your memory how the conversion to polar coordinates is done in practice, then watch the Khan Academy videos.

Solution.

Problem 2. (15 points) Find the real and imaginary part of the following complex numbers
(a) $(i - 1)/(i + 1)$.
(b) $(3 + 4i)/(1 - 2i)$.
(c) i^n for any integer n.

Solution.

Problem 3. (15 points) Calculate the modulus (=absolute value) of the following complex numbers:
(a) $-3 + i$.
(b) $2 + 3i$.
(c) i^n for all integers n.

Solution.

Problem 4. (10 points) Exercise 1.2 in the lecture notes.

Solution.

Problem 5. (10 points) Exercise 2.1 in the lecture notes.

Solution.

Problem 6. (10 points) Exercise 2.2 in the lecture notes.

Solution.

Problem 7. (10 points) Exercise 2.3 in the lecture notes.

Solution.

Problem 8. (10 points) Exercise 2.4 in the lecture notes.

Solution.

Checklist:
☐ Did you add your name?
☐ Did you disclose all resources that you have used?
(This includes all people, books, websites, etc. that you have consulted)
☐ Did you sign that you followed the Aggie honor code?
☐ Did you solve all problems?
☐ Did you submit the pdf file resulting from your latex file of your homework?
☐ Did you submit a hardcopy of the pdf file in class?