FINITE MATH, FALL 2016 - MIDERM I

Name: _____

Write your name in the blue book given along with this exam. Solve all of the problems listed below. If you do not solve the questions in order of which they are listed below, please be sure to label them clearly in the blue book.

You will recieve no credit for submitting solutions that the grader cannot readn and understand—write legibly!

Problem 1. One card is drawn at random from an ordinary deck of cards. Find the probability of the following events occurring:

(1) A black card?
(2) A diamond or a 7?
(3) A 9 or a 10?
(4) A red card or a face card?

Problem 2. If $A = \{\{a\}, a\}$ and $\mathcal{P}(A)$ is the power set of A. Find:

(1) $|\mathcal{P}(A)|$
(2) $\mathcal{P}(A)$
(3) Is $a \in A$?
(4) Is $a \subset A$?

Problem 3. A jar contains 3 white, 4 orange, 5 yellow, and 8 black marbles. If a marble is drawn at random, find the probability of the following:

(1) Not a black marble.
(2) A white marble.
(3) An orange marble.
(4) A yellow marble.
(5) A yellow or an orange marble.

Problem 4. A typical pack-a-day smoker spends about \$136.50 a month on cigarettes. Suppose a smoker decides instead to invest the money he would have used on cigarettes. Each month the smoker deposits \$136.50 into a savings account at 4.8% interest, compounded monthly.

(1) How much is the account worth after 40 years?
(2) How much money was deposited into the account?

Problem 5. Given the following diagrams of sets A, B, C, identify the shaded regions symbolically with sets operations:

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Date: October 7th, 2016.

(a)

(b)

(c)

(d)

(e)

(f)
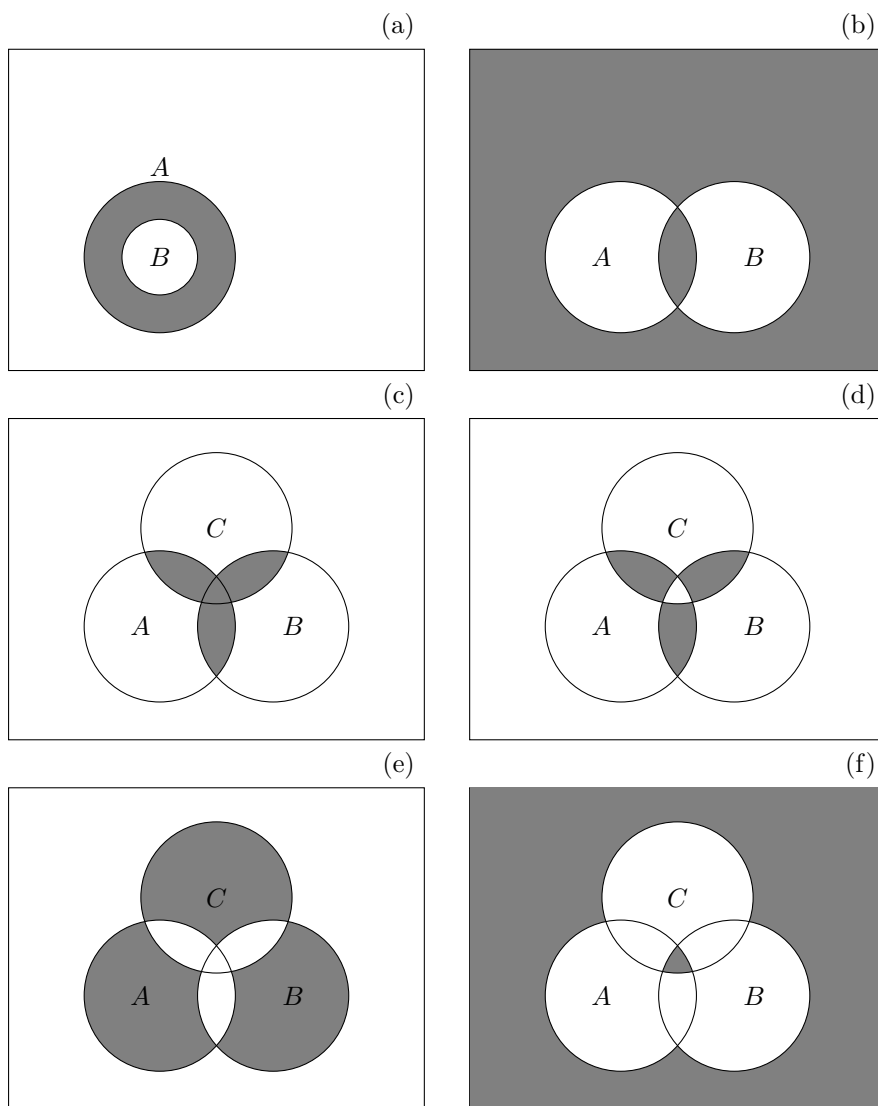
Problem 6. Extra Credit

Prove the following identity, or if you think it is false, give a counter example:

$$\left(A \bigcap B\right)' = A' \bigcup B'$$