Math 109-003
Assignment 1

Covers: Sections 3.1-3.6
Due: Thurs Jan 22 at 8:30am

INSTRUCTIONS:
This assignment will be marked for completion.
Solutions will be posted on the course website 24 hours after the deadline.
You may not copy the work of another person or AI.
Submit jpg or pdf files to the D2L Dropbox.

1. Let $U = \{a, e, i, o, u\}, A = \{e, i, u\}, B = \{a, e, u\}$ and $C = \{e, o\}$.
a) Find $(A \cap B) \cup C\,'$.
b) Write down all the subsets of C.

2. A non-profit organization has 400 employees: 325 are full-time, 260 are permanent, and 382 are full-time or permanent. Draw a Venn diagram.

3. Draw a Venn diagram for the following situation.

Of 70 science majors:
48 are taking biology
48 are taking chemistry
47 are taking physics
30 are taking biology and chemistry
31 are taking biology and physics
32 are taking chemistry and physics
19 are taking all three

4. How many four-letter words (including nonsense words) can be made from the letters V,W,X,Y,Z if:
a) letters can be repeated
b) letters cannot be repeated
c) letters can be repeated but the last two letters must be the same

5. We are randomly selecting four cards from a standard deck. In how many ways could we select:
a) only red cards
b) only hearts
c) only aces or kings
d) only aces

6. A box contains 10 white balls and 12 black balls. We randomly select six balls from the box. How many possible selections contain at least two black balls?