Intro to Math for Political Scientists

Homework 4

Fall 2017

1. Consider a problem in which you are rolling two dice.
    1. Create a set A consisting of all the outcomes from rolling the dice where the sum is equal to 5. (hint: an element will be an ordered pair like $(1, 2)$).
    2. Use set notation to denote the size of A.
    3. Use set notation to denote whether $(3, 1)$ is in A or not
2. Consider the following sets and find the following:

$$P = \{\text{UT GOV faculty members}\} \qquad n(P) = 70$$

$$T = \{\text{ UT GOV faculty with tenure}\} \qquad n(T) = 35$$

$$F = \{\text{Female UT GOV faculty members}\} \qquad n(F) = 15$$

$$M = \{\text{Male UT GOV faculty members}\} \qquad n(M) = 55$$

$$X = \{\text{Female UT GOV faculty members with tenure}\} \qquad n(X) = 10$$

$$Y = \{\text{Male UT GOV faculty members with tenure}\} \qquad n(Y) = 25$$

    1. $n(T \cap M)$
    2. $n(F \cup M)$
    3. $n(T \cap M)$
    4. $n(F \cup T)$
    5. $F^C \cup F$ - to which set is this equivalent?
    6. $X \cup Y$ - to which set is this equivalent?
3. Let X and Y be two sets, where $n(X) = 14$ and $n(Y) = 25$. If there are twice as many objects in $X \cup Y$ as there are in $X \cap Y$, how many objects are in *both* X and Y?