MATH 10B – Spring 2019
Quiz 1 – Prepared by John Yirong Zhen
Date:02/05/2018

You are to finish this quiz in 10 minutes. You are allowed one single-sided letter-size cheat sheet. No calculators or other notes/books/devices are allowed.
Your cheatsheet must be handwritten by you, no photocopying or preprinted (unless you have written permission from the instructor). Try your best! Stay calm and good luck!

I. True/False (2 pts)

Circle T or F in the space provided in front of the statement to indicate whether it is true or false respectively. You get +1 for a correct answer, −1 for incorrect, and 0 for leaving it blank. (You should not guess if you don't know the answer.)
You do not need to justify your answers for T/F statements.

- Ⓣ F The number of subsets with less than three elements of a 100-element set is $C(100, 2) + C(100, 1) + C(100, 0)$.
- T Ⓕ The coefficient of $x^{16}y^{13}$ in $(x + y)^{30}$ is $C(30, 16)$.

II. Written problems (10pts)

- You MUST **justify your answer** to undoubtably convince me that you solved and not guessed it. Partial credit will be given to good work and progress even if there is no final answer or the answer is incorrect. On the other hand, bogus justification for a correct answer will receive a 0.
- Keep your scratch work separate. Cross out writing you don't want to be graded and clearly label the parts you want to be graded.
- Points will be deducted for incorrect writings that you "forget to cross out."

See problem on back.

How many ways are there for 13 women and six men to stand in a line so that no two men stand next to each other? [Hint: First position the women and then consider possible positions for the men.]

First we arrange the women. Since we can permutate them and have a different arrangement, there are 13! different permutations. Then, the men can go in between two women or in the front and back. There are 14 spots the men can go, and the order matters. Thus, there are $P(14, 6)$ arrangements for men. In total, there are $13! \times P(14, 6)$ arrangements.