

## MATH 421 Q1 WINTER 2017 HOMEWORK 3

Due Feb. 9, 12pm.

Total 20 points.

QUESTION 1. (5 PTS) *How many ways are there to put 8 different books into 3 different boxes such that no box is left empty? The answer should be given in numerical value.*

QUESTION 2. (5 PTS) *How many ways are there to put 8 different books into 3 identical boxes (the boxes can be empty)? The answer should be given in numerical value.*

QUESTION 3. (5 PTS) *6 identical bottles of Pepsi and 6 identical bottles of Crush are distributed to three people. How many ways are there to do this if each person receives at least one bottle (doesn't matter Pepsi or Crush)? The answer should be given in numerical value.*

QUESTION 4. (5 PTS) *Prove that the number of partitions of  $n$  into three positive summands is equal to the number of partitions of  $2n$  into three positive summands of size less than  $n$ .*