

## Quiz 4: October 21, 2021

Name: \_\_\_\_\_

Student ID: \_\_\_\_\_

1. (2 points) How many numbers between 1 and 888,881 are divisible by 2, 5, and 13?
2. (1 points) How many numbers between 1 and 888,881 are **not** divisible by 2, 5, and 13?
  
3. (2 points) Give the number of Combinations of  $n$  things taken  $k$  at a time ( $C(n,k)$ ) in terms of Permutations, and explain why this makes sense in English.
  
  
  
  
  
  
  
  
  
  
4. The questions below talk about 5-card hands taken from a deck of 52 cards. Each card in the deck has a rank (A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K) and a suit (C, D, H, S—for clubs, diamonds, hearts, or spades).
  - (a) (2 points) Give the formula for how many 5-card hands have 3 of a kind (but not 4 of a kind, and not 3 of a kind and 2 of a kind).
  - (b) (2 points) Give the formula for how many 5-card hands have 2 pairs and a fifth card that is a different rank than either of the pairs.
  - (c) (1 point) Explain why 3 of a kind is a more valuable hand than 2 pairs, in English.