

Math 109 Test One

Time: 50 minutes

Total: 25 marks

Name: _____

1. [5 marks] Let $A = \{4, 7, 8, 9\}$, $B = \{5, 6, 7, 9\}$ and $C = \{4, 5, 8, 9\}$.

a) Find $(A \cap B) \cup (B \cap C)$

b) Write out all the subsets of A that contain exactly two elements.

2. [2 marks] A six-sided die is rolled twice and we record the total of the two numbers that are rolled. Write out the sample space of this experiment.

3. [4 marks] Twelve people apply for a job and eight of them are qualified. How many ways are there to:

a) Select two qualified applicants and two unqualified applicants for an interview

b) Select four of the applicants for an interview if we select from all the applicants

c) Rank the qualified applicants from most qualified to least qualified

4. [3 marks] We have three different textbooks (Math, Economics and Statistics) and their solution manuals. We want to arrange these six objects in a row on a bookshelf so that each solution manual is beside the appropriate textbook, either to the left or right. How many different ways are there to do this?

5. [3 marks] Draw a Venn diagram and shade in $A' \cap (B \cup C)$

6. [4 marks] An experiment has three possible outcomes: A, B and C. Write down the probability distribution if the probability of A is 0.15 and C is four times as likely as B.

7. [4 marks] Draw a Venn diagram for the following situation.

Out of 70 students:

23 like to run

25 like to bike

32 like to swim

7 like to run and bike

8 like to run and swim

9 like to bike and swim

4 like to run, bike and swim