

Math 109 Assignment Two

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

**Assignments must be completed on this paper.**

**Attach extra pages if necessary.**

**Show all your work for full marks.**

Coverage: 3.4-3.6 and 4.1-4.4

1. [2 marks] Twelve people interview for a job. How many ways are there to:

a) select the best and second-best candidates?

b) rank all the candidates 1 through 12?

2. [3 marks] You select four cards simultaneously from a standard deck of cards.

a) How many selections consist of four diamonds?

b) How many selections consist of no diamonds?

3. [2 marks] Point B is five blocks south and six blocks east of Point A. How many shortest routes are there from A to B that don't go south for two consecutive blocks?

4. [4 marks] Toss a coin 4 times and observe heads or tails on each toss.

a) How many outcomes are in the sample space?

b) Let E: the first toss is tails. Let F: at most two tails appear among the four tosses. Write out  $E \cap F'$

5. [2 marks] A company has two suppliers, A and B. The probability that Supplier A is late is 0.15. The probability that Supplier B is late is 0.13. The probability that both suppliers are late is 0.09. Find the probability that neither supplier is late.

6. [4 marks] A box contains 17 good and 3 defective items. Two items are randomly selected from the box. The box will be rejected by quality control if any of the selected items are defective. Find the probability that the box is rejected by quality control.

7. [3 marks] At a certain accounting firm:

60% of employees are accountants

45% of employees do CrossFit

35% of employees are accountants and do CrossFit.

Find the probability that an employee who is an accountant does not do CrossFit.