

1 MATH 107/CCE - Spring 2004

University of Rhode Island

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Practice for Final Exam

5/05/2004

Part 1.

1. A survey of 110 students showed the following:

48 take biology

49 take history

44 take statistics

20 take history and biology

14 take history and statistics

21 take biology but not statistics

7 take all three

How many students:

(a) take biology but neither of the other two ?

(b) take at least one of the three ?

(c) take exactly two of the three ?

(d) take biology or history ?

2. A group of seven women and ten men must select a six-person committee. How many committees are possible if it must consist of the following

(a) two women and four men.

(b) at least four women.

(c) any mixture of men and women

(d) two women as president and vice president and two women and two men as members.

3. In the Smallville area 20% of crimes occur during the day, and 70% of crimes occur within the city limits.

(a) If 10% of crimes occur outside the city limits during the day, what percentage of crimes occurs within the city limits at night ?

(b) What percentage of crimes occurs outside the city limits at night ?

4. Let A be the event that you loose your spare set of car keys, and let B be the event that your car is locked.

- (a) If $P(A) = 0.4$, $P(A \cup B) = 0.8$, $P(A \cap B) = 0.3$, what is $P(A - B)$ and $P(B - A)$?
- (b) If $P(B) = 0.4$, $P(A | B) = 0.6$, what is $P(A - B)$ and $P(B | A)$?
- (c) If A and B are independent and $P(A) = 0.4$, $P(B) = 0.7$, what is the probability that exactly one of A and B happened ?

5. The probability that Brand X computer disk is faulty is 2%, whereas the probability that Brand Y computer disk is faulty is 4%. Data for your final project are written to 20 disks, consisting of 5 Brand X and 15 Brand Y disks.

- (a) Draw tree diagram to visualize the problem.
- (b) A randomly chosen disk is faulty. What is the probability that is a Brand Y disk ?
- (c) A randomly chosen disk is not faulty. What is the probability that is a Brand X disk ?

Part 2.

6. The results of a quiz are given in the following table:

Score	10	9	8	7	6	5
# of Students	4	5	19	14	5	3

- (a) Find the mean, median, and standard deviation of scores.
- (b) What percent of the data lies within two standard deviation of the mean ?
- (c) Construct a pie chart and a histogram to represent the data.

7. Suppose that car mufflers last random times that are normally distributed with mean three years and standard deviation one year. If a family buys new car, what is the probability that:

- (a) the muffler of new car will last at least two but not more than 2.5 years;
- (b) the muffler of new car will last at least 3 years;

8. Sixty one percent of a poll of a random sample of 1000 people support a council's plan for increasing the property tax.

- (a) Find 90% and 95% confidence intervals for the proportion of residents who are in favor of the plan.
- (b) How large sample should be used if a 96% confidence interval is used with the maximum margin error of 4% ?