

Review Problems for Exam 2

Math 1040-1

1. You roll two fair dice.
 - (a) Draw a tree diagram for this experiment.

 - (b) What is the probability that you roll an even number on the first die and a 5 on the second die?

 - (c) What is the probability that the numbers on the two dice add to 9? What is the probability that they add to 7?

 - (d) What is the complement of the event that you roll an even number on the first die? What is the probability of this event?

2. What is the probability that when drawing two cards from a standard deck (without replacement) you draw two aces? What is the probability that either the first card or the second card is an ace?

3. In a sales effectiveness seminar, a group of sales representatives tried two approaches to selling a customer a new automobile: the aggressive approach and the passive approach. For 1160 customers, the following record was kept:

	Sale	No Sale	Total
Aggressive	270	310	580
Passive	416	164	580
Total	686	474	1160

- (a) What is the probability that a sale was made to a randomly chosen customer?
- (b) What is the probability that a sale was made to a randomly chosen customer, knowing that a sales representative tried the aggressive approach?
- (c) Are the events “sale” and “aggressive approach” independent or dependent? Explain.
- (d) What is the probability that an aggressive approach was used and a sale was made for a customer chosen at random?
- (e) What is the probability that an aggressive approach was used or a sale was made for a customer chosen at random?

4. There are three nursing positions to be filled at a certain hospital: a day nursing supervisor, a night nursing supervisor, and a nursing coordinator position. There are 15 applicants qualified for all three positions. Determine the number of different ways the positions can be filled by these applicants.
5. One professor grades homework by randomly choosing 5 out of 12 homework problems to grade.
- (a) How many different groups of 5 problems can be chosen from the 12 problems?
- (b) Sylvia only completed 7 problems from the assignment. What is the probability that she did not miss any questions that will be graded?

6. Suppose the parole board is examining five prisoners up for parole. Let x represent the number of prisoners out of five on parole who become repeat offenders while on parole. Then, the probability distribution for x is

x	0	1	2	3	4	5
$P(x)$	0.237	0.395	0.264	0.088	0.015	0.001

- (a) What is the probability that at least 3 prisoners will become repeat offenders?

- (b) What is the average number of repeat offenders?

- (c) What is the standard deviation for the number of repeat offenders?

7. The Orchard Café has found that about 5% of the diners who make reservations do not show up. If 82 reservations have been made, what is the probability that exactly 4 diners with reservations do not show up?

8. On the leeward side of the island of Oahu, in the small village of Nanakuli, about 80% of the residents are of Hawaiian ancestry (Source: *The Honolulu Advertiser*). Let x represent the number of people you meet until you encounter the first person of Hawaiian ancestry in the village of Nanakuli. What is the probability that the first person you encounter with Hawaiian ancestry is at least the fourth that you meet?
9. *USA Today* reported that for all airlines, the number of lost bags was 12.78 per 1000 passengers in December. What is the probability that out of 1000 passengers, no bags are lost? What is the probability that exactly 13 bags are lost?