

Review

1. Standard deck of card contains 52 cards. Find the probability of:

- a) Selecting a club card

- b) Getting an ace or a jack

- c) Choosing a club or a jack

- d) If 3 cards are selected **with replacement** find the probability all three are aces?

2. Fill in the blank. The _____ of two events A and B is the event that either A or B or both A and B occur.

- a. Intersection b. Union c. Complement d. Venn diagram

3. The managers of a company were surveyed to determine the background that leads to a successful manager. His/her boss rated each manager as being either a good, fair, or poor manager. Educational background was also noted. The data appear below:

Educational Background

Manager Rating	High School Degree	Some College	College Degree	Advance Degree (Master's or Ph.D.)	Totals
Good	2	3	22	12	39
Fair	5	15	45	22	87
Poor	3	8	9	14	34
Totals	10	26	76	48	160

- 1) What proportion of the managers had **at most college degree educational level**?
- 2) What proportion of the managers are **either fair or college degree** recipients?
- 3) If we randomly selected one manager from this company, find the probability that he/she **does not have an advanced degree and is a poor manager**?
- 4) **Given that** the manager is only a **good** manager, what is the probability that this manager has at least **some college background**?
- 5) Are the events **(A) Manager has only college degree** and **(B) Manager is a fair Manager** independent? Prove numerically.

4. The distribution for the scores of a nationally recognized test is mound shaped and symmetric. A student receives a test score who's associated z-score is 2. Approximately what percentile is associated with this score?

5. Suppose a basketball player is an excellent free throw shooter and makes 93% of his free throws (i.e., he has a 93% chance of making a single free throw). Assume that free throw shots are independent of one another. Suppose this player gets to shoot three free throws. Find the probability that he misses all three consecutive free throws.

- a. 0.8044 b. 0.1956 c. 0.9997 d. 0.0003

6. A university received 12 PC. Unknown to the university, 5 of these new computers are defective. The computer technician set up 2 of the computers. Find the probability that at least one of the computers will not be a defective.

- a. $7/132$ b. $20/132$ c. $112/132$ d. $2/12$

7. At a hospital nursing station the following information is available about a patient. For each variable described, indicate whether it is nominal, ordinal, interval or ratio.

- _____ 1) Name: Jim Wood
- _____ 2) Age: 27
- _____ 3) Weight: 165 lb.
- _____ 4) Blood type: A
- _____ 5) Temperature: 96.8 F
- _____ 6) Condition: Fair
- _____ 7) Date of admission: March 21, 2003
- _____ 8) Response to treatment: Excellent

8. In the game of Parcheesi each player rolls a pair of dice on each turn. In order to begin the game, you must roll a five on at least one die, or a total of five on both dice. Find the probability that a player begins the game on their first roll.

- A) 11/36 B) 6/36 C) 15/36 D) 10/36

9. A local country club has a membership of 600 and operates facilities that include an 18-hole championship golf course and 12 tennis courts. Before deciding whether to accept new members, the club president would like to know how many members regularly use each facility. A survey of the membership indicates that 60% regularly use the golf course, 48% regularly use the tennis courts, and 10% use neither of these facilities regularly. What percentage of the 600 use at least one of the golf or tennis facilities?

- A) 90% B) 18% C) 10% D) 98%

10. A state energy agency mailed questionnaires on energy conservation to 1,000 homeowners in the state capital. Five hundred questionnaires were returned. Suppose an experiment consists of randomly selecting one of the returned questionnaires. Consider the events:

- A: {The home is constructed of brick}
B: {The home is more than 30 years old}
C: {The home is heated with oil}

11. In terms of A, B, and C, describe a home that is constructed of brick and is less than or equal to 30 years old.

- A) $(A \cap B)^c$ B) $A \cup B$ C) $A \cap B^c$ D) $A \cap B$

12. A human gene carries a certain disease from the mother to the child with a probability rate of 38%. That is, there is a 38% chance that the child becomes infected with the disease. Suppose a female carrier of the gene has four children. Assume that the infections of the four children are independent of one another. Find the probability that all four of the children get the disease from their mother.

- A) 0.979 B) 0.148 C) 0.091 D) 0.021

13. A machine has four components, A, B, C, and D, set up in such a manner that all four parts must work for the machine to work properly. Assume the probability of one part working does not depend on the functionality of any of the other parts. Also assume that the probabilities of the individual parts working are $P(A) = P(B) = 0.93$, $P(C) = 0.9$, and $P(D) = 0.95$. Find the probability that the machine works properly.

- A) 0.7395 B) 0.7784 C) 0.2605 D) 0.7952

14. Investing is a game of chance. Suppose there is a 39% chance that a risky stock investment will end up in a total loss of your investment. Because the rewards are so high, you decide to invest in five independent risky stocks. Find the probability that at least one of your five investments becomes a total loss.

- A) 0.27 B) 0.054 C) 0.9155 D) 0.009

15. Classify the events as dependent, independent, or mutually exclusive.

Events A and B were $P(A) = 0.9$, $P(B) = 0.7$, and $P(A \text{ and } B) = 0.62$

- A) dependent B) independent C) mutually exclusive

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17. A university received 12 PC. Unknown to the university, 5 of these new computers are defective. The computer technician set up 2 of the computers. Find the probability that at least one of the computers will not be a defective.

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16.A manufacturer of 35-mm cameras knows that a shipment of 40 cameras sent to a large discount store contains nine defective cameras. The manufacturer also knows that the store will choose two of the cameras at random, test them, and accept the shipment if neither is defective. What is the probability that the shipment is accepted?

- a. 0.1788 b. 0.0462 c. 0.5962 d. 0.4038