

Chapter 4 Probability Review

Know the important terms on page 246 and the important formulas on page 247

1. The probability that an event happens is 0.45. What is the probability that the event won't happen?
a) -0.45 b) 0 c) 0.55 d) 1
2. When you roll a die and you know that you have a 1 out of 6 chance of rolling a two, what type of probability are you using?
a) Classical b) Empirical c) Relative d) Subjective
3. The sample space for rolling two dice consists of how many outcomes?
a) 6 b) 12 c) 24 d) 36 e) 216
4. What is the probability of flipping two coins and getting two heads?
a) 0.5 b) 0.25 c) 0.1 d) 0.75 e) 1

True/False.

5. The set of all possible outcomes of a probability experiment is called the sample space.
6. The probability of an event can be any number between and including 0 and 1.
7. If an event cannot occur, its probability is -1.
8. The sum of the probabilities of the events in the sample space is 1.
9. When two events cannot occur at the same time, they are said to independent events.
10. The complement of picking a king from a standard deck of playing cards is getting a king.
11. What is the difference between Classical, Empirical, and Subjective Probability?
12. A family has three children. What is the probability that exactly two of them are girls?
(Use a tree diagram, if needed)

13. When a card is drawn from a standard deck of 52 cards find the following probabilities:

- a) Picking a queen
- b) picking a red card
- c) picking a spade
- d) picking a 3 or a diamond
- e) picking a 10 and a heart

14. M&M plain candies come in a variety of colors. According to the manufacturer, the color distribution is:

Color	Orange	Green	Red	Yellow	Brown	Tan
Percent	15%	10%	20%	20%	30%	5%

Suppose you have a large bag of plain M&M candies and you reach in and take one candy at random. Find:

- a. $P(\text{orange candy or tan candy})$
- b. Are these outcomes mutually exclusive? Explain mathematically? In context?
- c. $P(\text{not brown candy})$

15. The table below shows a survey of 100 authors by a publishing company:

	New Author (N)	Established Author (N^c)	Total
Successful (S)	5	25	30
Unsuccessful (S^c)	15	55	70
Total	20	80	100

- a. Find the probability that an author is successful.
- b. Find the probability that an author is successful or established.
- c. Find the probability that an author is successful and established.

d. Find the probability that an author is established given that she is successful.

e. Find the probability that an author is successful given that he is established.

16. In a monthly report, the local animal shelter states that it currently has 24 dogs and 18 cats available for adoption. Eight of the dogs and 6 of the cats are male. Find each of the following conditional probabilities if an animal is selected at random:

a) The pet is male, given that it is a cat.

b) The pet is cat, given that it is female.

c) The pet is female, given that it is a dog.

d) Are the species and sex of the animals independent?

17. When two cards are drawn from a standard deck of 52 cards find the following probabilities:

WITH REPLACEMENT

a) Picking two aces

b) picking two hearts

WITHOUT REPLACEMENT

c) Picking two aces

d) Picking two hearts

18. If 17% of the people in United States smoke, find the probability of picking three people at random and finding that all three smoke.

19. A box of 30 computer components has 5 that are defective. If you test 2 of these components, find the probability that both work properly.

20. If you draw 4 cards and replace the card each time, find the probability of drawing **at least** one ace from a standard deck of playing cards.

21. There are 15 marbles in a bag. 10 are yellow and 5 are red. If you draw 3 and replace the marble each time, what is the probability of drawing **at least** 1 red?

22. You are off to soccer, and want to be the *Goalkeeper*, but that depends who is the Coach today:

with Coach Sam the probability of being *Goalkeeper* is **0.5**

with Coach Alex the probability of being *Goalkeeper* is **0.3**

Sam is Coach more often ... about 6 out of every 10 games (a probability of **0.6**).

a.) Make a tree diagram to represent the situation.

b.) What is the probability you will be a *Goalkeeper* today?

a.) If you are not goalkeeper, what is the probability that Alex is the coach today?