

1. Lynn and Dawn tossed a coin 30 times and got heads 20 times. What is the experimental probability of tossing heads using Lynn and Dawn's results?
2. What is the sum of the theoretical probability of an event and its complement?
3. A spinner is numbered from 1 through 10 with each number equally likely to occur. What is the probability of obtaining a number less than 4 or greater than 8 in a single spin?
4. A bag contains 7 red marbles, 6 white marbles, and 4 blue marbles. If one marble is picked from the bag, find  $P(\text{red or blue})$ .
5. A bag contains 7 red marbles, 6 white marbles, and 4 blue marbles. If one marble is picked from the bag, find  $P(\text{not blue})$ .

For problems 6-7, suppose  $Q$  and  $R$  are independent events. Find  $P(Q \text{ and } R)$ .

6.  $P(Q) = 0.77, P(R) = 0.73$

7.  $P(Q) = \frac{4}{15}, P(R) = \frac{8}{13}$

8. Two urns contain white balls and yellow balls. The first urn contains 5 white balls and 2 yellow balls and the second urn contains 5 white balls and 8 yellow balls. A ball is drawn at random from each urn. What is the probability that both balls are white?

For problem 9, suppose  $S$  and  $T$  are mutually exclusive events. Find  $P(S \text{ or } T)$ .

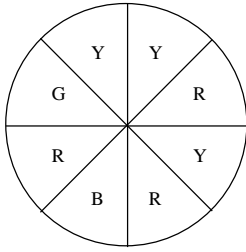
9.  $P(S) = \frac{3}{4}, P(T) = \frac{2}{11}$

10. Use the frequency table. Find the probability that a person goes to the movies at least 5 times a month. Round to the nearest thousandth.

Trips to the Movies

Number of Movies	Number of Moviegoers
More than 7 movies per month	80
5-7 movies per month	134
2-4 movies per month	213
Less than 2 movies per month	247
<b>Total</b>	<b>674</b>

11. The dartboard has 8 sections of equal area. The letters represent the colors red (R), yellow (Y), blue (B), and green (G). Use a table to show the probability distribution for a dart that hits the board at a random location.



12. The table shows the results of a survey of students in two math classes. Round answers to the nearest thousandth.

Did You Watch More Than One Hour of TV Last Night?

	Yes	No
<b>3rd period class</b>	9	9
<b>6th period class</b>	7	5

- Find  $P(\text{not watching more than one hour of TV} \mid 3^{\text{rd}} \text{ period class})$
  - Find  $P(\text{not watching more than one hour of TV or } 3^{\text{rd}} \text{ period class})$
  - Find  $P(\text{watching more than one hour of TV} \mid 6^{\text{th}} \text{ period class})$
  - Find  $P(\text{watching more than one hour of TV and } 6^{\text{th}} \text{ period class})$ .
13. The table shows the results of a survey of college students. Round answers to the nearest thousandth.

First Class of the Day for College Students

	Male	Female
<b>Humanities</b>	95	85
<b>Science</b>	85	60
<b>Other</b>	50	100

- Find  $P(\text{Humanities and Female})$
- Find  $P(\text{Science or Male})$
- Find  $P(\text{Humanities} \mid \text{Male})$
- Find  $P(\text{Other} \mid \text{Female})$

14. Each person in a group of students was identified by year and asked when he or she preferred taking classes: in the morning, afternoon, or evening. The results are shown in the table. Find the probability that the student preferred morning classes **given** he or she is a Senior. Round to the nearest thousandth.

When Do You Prefer to Take Classes?

	Freshman	Sophomore	Junior	Senior
Morning	13	15	20	11
Afternoon	15	5	17	16
Evening	11	7	3	14

15. The probability that a city bus is ready for service when needed is 83%. The probability that a city bus is ready for service and has a working radio is 70%. Find the probability that a bus chosen at random has a working radio given that it is ready for service. Round to the nearest tenth of a percent.
16. In how many different orders can you line up 5 cards on a shelf?

**In problems 17-20, evaluate the expression.**

17.  $7!$

18.  ${}_5C_3$

19.  ${}_9P_7$

20.  $\frac{{}_6P_4}{{}_3P_2}$

21. There are 11 students participating in a spelling bee. In how many ways can the students who go first, second, third, and fourth in the bee be chosen?
22. 5 singers be selected from 10 who came to an audition. How many possible outcomes could there be?
23. There are 9 people on the ballot for regional judges. Voters can vote for any 4. Voters can choose to vote for 0, 1, 2, 3 or 4 judges. In how many different ways can a person vote?

**In problem 24 & 25, expand the binomial using Pascal's Triangle.**

24.  $(2x + y)^6$

25.  $(3a - b)^3$