Algebra II - Probability REVIEW

1.   A study of traffic patterns in a large city shows that if the weather is rainy, there is a 50% chance of an automobile accident occurring during the morning commute. If the weather is clear, the chance of an accident is reduced to 35%. Suppose the weather forecast for tomorrow predicts a 70% chance of rain.
a. Draw a tree diagram based on the information.

b. Find P(it will rain tomorrow and there will be an accident). Show your work.

c. Find P(there will be an accident tomorrow). Show your work.

2.   Lynn and Dawn tossed a coin 60 times and got heads 32 times. What is the experimental probability of tossing heads using Lynn and Dawn's results?

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 2 or greater than 7 in a single spin?

4.   A bag contains 7 red marbles, 7 white marbles, and 4 blue marbles. Find P(red or blue).

Suppose Q and R are independent events. Find $P(Q$ and $R)$.

5. $P(Q) = 0.02$, $P(R) = 0.78$

6. $P(Q) = \frac{2}{3}$, $P(R) = \frac{1}{7}$

7.   Two urns contain white balls and yellow balls. The first urn contains 4 white balls and 9 yellow balls and the second urn contains 9 white balls and 10 yellow balls. A ball is drawn at random from each urn. What is the probability that both balls are white?

Suppose _S_ and _T_ are mutually exclusive events. Find _P_(_S_ or _T_).

8. _P_(_S_) = 10%, _P_(_T_) = 43%

9. $P(S) = \dfrac{1}{4}$, $P(T) = \dfrac{1}{12}$

10. If all possible results are equally likely, what is the probability that a spin of the spinner will land on an upper case letter or a consonant?
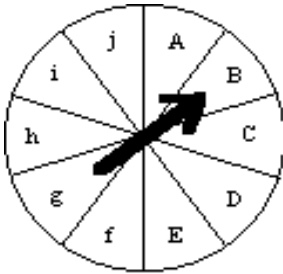
11. Use the frequency table. Find the probability that a person goes to the movies at least 5 times a month. Round to the nearest thousandth.

Trips to the Movies

Number of Movies	Number of Moviegoers
More than 7 movies per month	112
5–7 movies per month	184
2–4 movies per month	273
Less than 2 movies per month	213
Total	**782**

12. The table shows the results of a survey of students in two math classes.
Find _P_(more than 1 hour of TV | 6th period class). Round to the nearest thousandth.

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

	Yes	No
3rd period class	6	10
6th period class	15	8

13. The table shows the results of a survey of college students. Find the probability that a student is taking a humanities class, given the student is male. Round to the nearest thousandth.

First Class of the Day for College Students

	Male	Female
Humanities	55	75
Science	65	60
Other	75	90

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 afternoon classes given he or she is a freshman. Round to the nearest thousandth.

When Do You Prefer to Take Classes?

	Freshman	Sophomore	Junior	Senior
Morning	4	18	17	10
Afternoon	15	4	4	7
Evening	11	11	17	5

15.   The probability that a city bus is ready for service when needed is 76%. 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.   A class of 40 students has 11 honor students and 10 athletes. Three of the honor students are also athletes. One student is chosen at random. Find the probability that this student is an athlete if it is known that the student is not an honor student. Round to the nearest thousandth.

17.   Suppose you roll a standard number cube once. Are rolling a 4 and rolling a 6 mutually exclusive events? Explain.

18.   In how many different orders can you line up 5 cards on a shelf?

19.   Verne has 8 math books to line up on a shelf. Jenny has 5 English books to line up on a shelf. In how many more orders can Verne line up his books than Jenny?

Evaluate the expression.

20. $4!$

21. $_8P_3$

22. $_7C_5$

23. $\dfrac{7!}{4!\,3!}$

24. $\dfrac{_{60}C_3}{_{15}C_3}$

25.   There are 9 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?
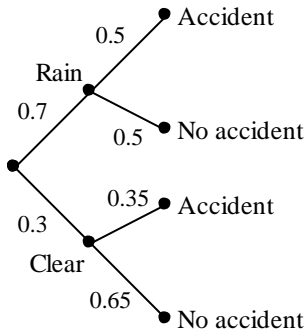
26.   In how many ways can 3 singers be selected from 10 who came to an audition?

27.   There are 6 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?

Algebra II - Probability REVIEW
Answer Section

1.

[4] **a.**

b. P(rain tomorrow and accident)

   $= P$(rain) $\times P$(rain and accident)

   $= 0.7 \times 0.5$

   $= 0.35 = 35\%$

c. P(accident)

   $= P$(rain tomorrow and accident) $+ P$(clear tomorrow and accident)

   $= 0.35 + (0.3 \times 0.35)$

   $= 0.455 = 46\%$

2. $\dfrac{8}{15}$

3. $\dfrac{2}{5}$

4. $\dfrac{11}{18}$

5. 0.0156

6. $\dfrac{2}{21}$

7. $\dfrac{36}{247}$

8. 53%

9. $\dfrac{1}{3}$

10. 0.9

11. 0.379

12. 0.652

13. 0.282

14. 0.500

15. 92.1%

16. 0.241

17. Yes; you cannot roll a 4 and a 6 at the same time.

18. 120

19. 40,200

20. 24

21. 336

22. 21

23. 35

24. $\dfrac{6844}{91}$

25. 3,024 ways

26. 120

27. 57