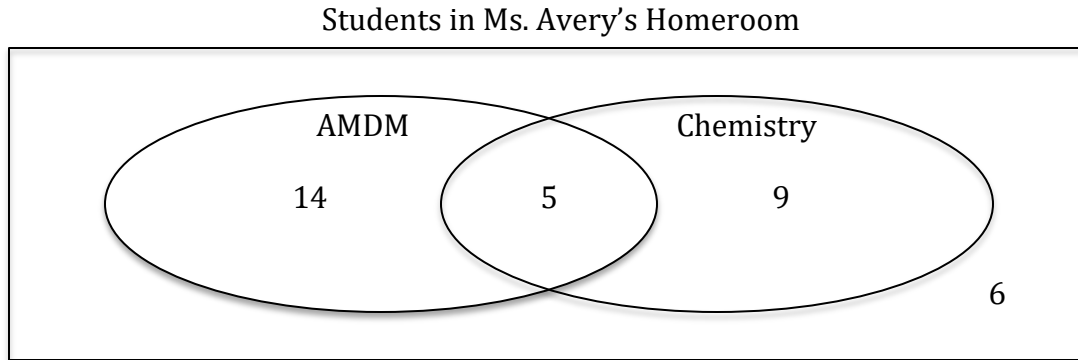


Using Venn Diagrams to Determine Probabilities

Date _____ Period _____

Ms. Avery conducted a survey of her homeroom. She asked students what math course and what science course they are taking this semester. Below are the results.

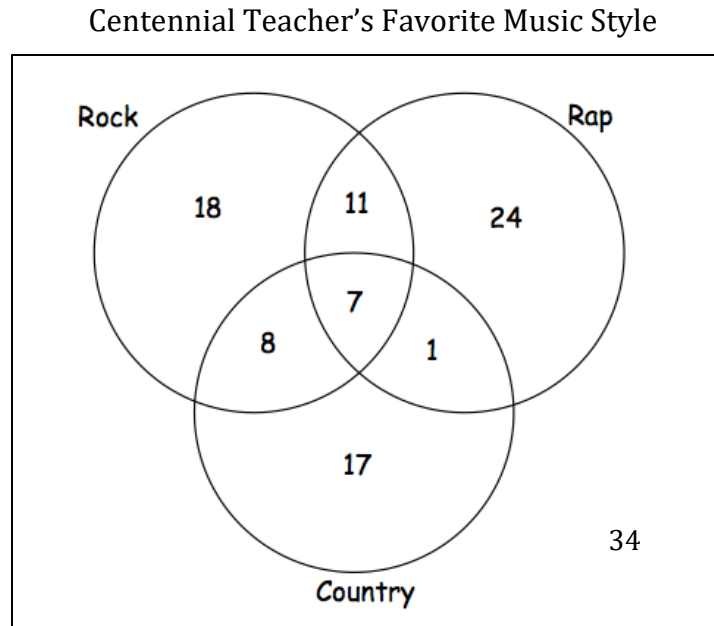


1. How many students are in Ms. Avery's homeroom?
2. How many students are taking AMDM?
3. How many students are taking Chemistry?
4. How many students are taking AMDM **and** Chemistry?
5. How many students take AMDM **or** Chemistry?
6. If a student is selected at random from Ms. Avery's homeroom, what is the probability that the student is taking AMDM?
7. If a student is selected at random from Ms. Avery's homeroom, what is the probability that the student is taking Chemistry?
8. If a student is selected at random from Ms. Avery's homeroom, what is the probability that the student is taking AMDM **and** Chemistry?
9. If a student is selected at random from Ms. Avery's homeroom, what is the probability that the student is taking AMDM **or** Chemistry?
10. If a student is selected at random from Ms. Avery's homeroom, what is the probability that the student is not taking AMDM or Chemistry?

What is another method for finding this probability?

11. Given that the student is not taking AMDM, what is the probability of a student taking Chemistry?
(*Hint: The total number of outcomes has changed.)

The following Venn diagram represents the responses to a question posed to teachers at Centennial High School about their favorite style of music.



1. How many teachers are represented in the diagram?

2. How many teachers like Country?

3. If one teacher is chosen at random, what is the probability that that teacher will like Rap music?
 $P(\text{rap}) =$

4. If one teacher is chosen at random, what is the probability that that teacher will like Country or Rock music?
 $P(\text{country or rock}) =$

5. If one teacher is chosen at random, what is the probability that that teacher will like country and rock music?
 $P(\text{country and rock}) =$

6. If one teacher is chosen at random, what is the probability that that teacher will not like Rock, Rap or Country?

7. The administration wants to have a social event for the teachers. What type of music should they play to make the most teachers happy? Justify your answer.

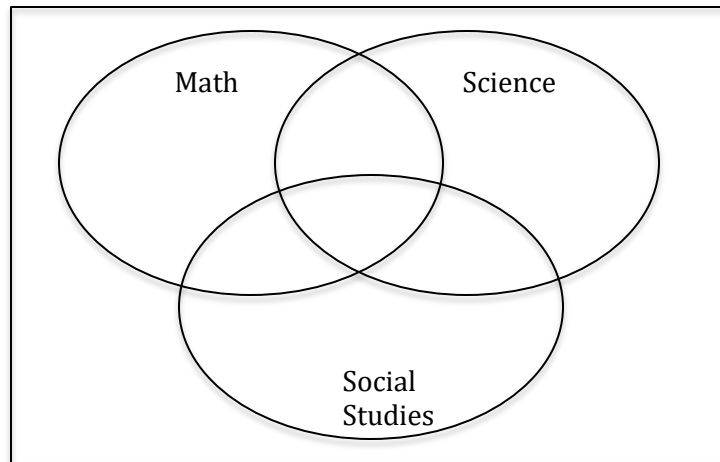
One hundred people were asked if they prefer Math, Science or Social Studies. The results are the following:

56 prefer Math
43 prefer Science
35 prefer Social Studies
6 prefer all three subjects

18 prefer Math and Science
10 prefer Science and Social Studies
12 prefer Math and Social Studies

Fill in the Venn diagram based on the information above.

Preferred Subject of 100 people



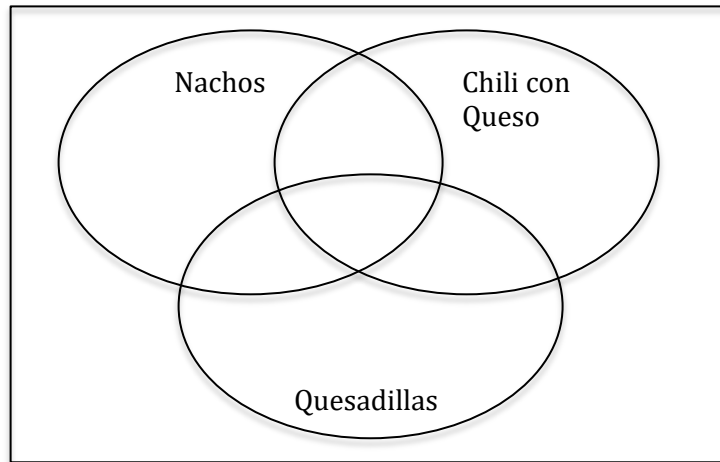
1. How many people prefer only Math?
2. How many people prefer only Science?
3. If one person is chosen at random, what is the probability they will prefer Science and Math?
4. If one person is chosen at random, what is the probability they will prefer only Math?
5. If one person is chosen at random, what is the probability they will not prefer Science?
6. Given that the person prefers Social Studies, what is the probability they prefer Math?
7. Given that the person prefers Science and Social Studies, what is the probability that they prefer Math?
8. Given that the person prefers Science, what is the probability that they prefer Math?
9. If one person is chosen at random, what is the probability they will not prefer Science, Math, or Social Studies?
10. Put a star in the section of the Venn diagram you would consider yourself to be in. Write the section name below.

104 people seated at different tables in a Mexican restaurant were asked if their party had ordered any of the following items: nachos, chili con queso, or quesadillas. The following is what was found:

- 11 people had ordered all three of these items.
- 41 people had ordered quesadillas.
- 50 people had ordered nachos
- 40 people had ordered chili con queso.
- 13 people had ordered nachos and quesadillas.
- 26 people had ordered nachos and chili con queso.
- 20 people had ordered quesadillas and chili con queso.

Fill in the Venn diagram based on the information above.

Orders of People at Mexican Restaurant



1. How many people ordered quesadillas and chili con queso but did not order nachos?
2. How many people ordered just nachos?
3. If a person is chosen at random, what is the probability that they ordered chili con queso?
4. If a person is chosen at random, what is the probability that they did not order any of these items?
5. Given that a person ordered nachos, what is the probability that they also ordered quesadillas?
6. Given that a person ordered quesadillas and chili con queso, what is the probability that they also ordered nachos?
7. If a person is chosen at random, what is the probability that they ordered at least 2 of the items?

Extension: Draw a Venn diagram that contains four categories that contain all possible combinations.

**Hint: This is not the answer.

