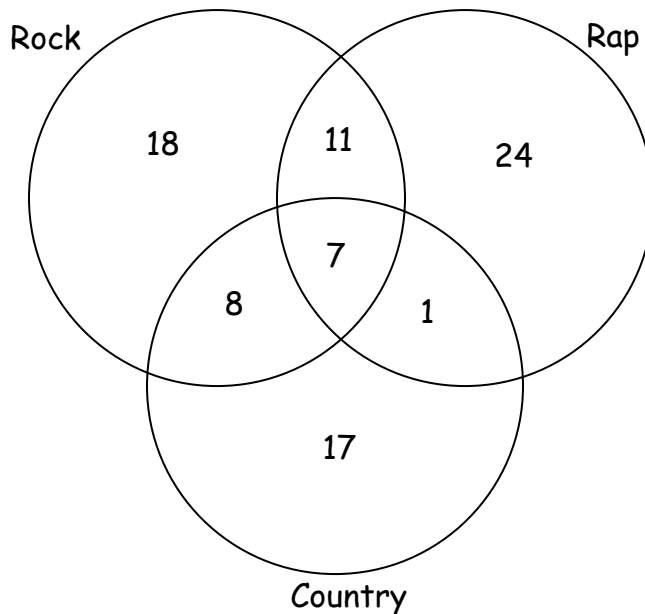


(A) REVIEW: Venn Diagrams: Use the Venn Diagram below to answer question 1 – 8.



1. How many total people are represented in the diagram? _____
2. How many people like country? _____
3. What is the probability that a randomly selected person will like rap music?
4. What is the probability that a randomly selected person will like country or rock music?
5. What is the probability that a randomly selected person will like country and rock music?
6. What is the probability that a randomly selected person will like rock music, given that they like rap?
7. What is the probability that a randomly selected person will like country music, given that they like rock?
8. If two people are chosen at random, what is the probability that that:
 - a. Both will like country
 - b. Both like country but not rock music?
 - c. One will like rap music?

Probabilities and Venn Diagrams | Lesson 53

(B) **REVIEW: Venn Diagrams** → Use the following information to fill in the Venn Diagram below.

100 people were asked if they liked Math, Science, or Social Studies. Everyone answered that they liked at least one.

56 like Math

43 like Science

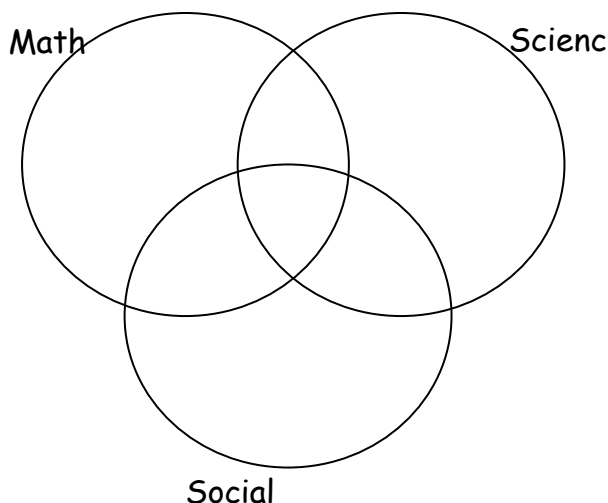
35 like Social Studies

18 like Math and Science

10 like Science and Social Studies

12 like Math and Social Studies

6 like all three subjects



1. How many people like Math only? _____
2. How many people like Science only? _____
3. What is the probability that a randomly selected person will like Science and Math?
4. What is the probability that a randomly selected person will like only Math?
5. What is the probability that a randomly selected person will not like Science?
6. What is the probability that a randomly selected person will like Science or Math?
7. What is the probability that a randomly selected person will like Science but not math?
8. What is the probability that a randomly selected person will like Math, given that they like science?
9. What is the probability that a randomly selected person will not like Social Studies, given that they do not like Math?

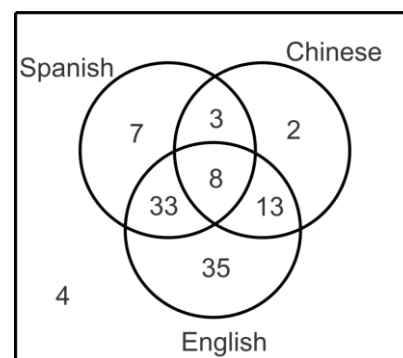
(C) Practice with Venn Diagrams

1. Of 400 college students, 120 are enrolled in math, 220 are enrolled in English, and 55 are enrolled in both. If a student is selected at random, find the probability that
 - a. the student is enrolled in mathematics.
 - b. the student is enrolled in mathematics or English.
 - c. the student is enrolled in either mathematics or English, but not both.

2. In a group of 35 children, 10 have blonde hair, 14 have brown eyes, and 4 have both blonde hair and brown eyes. If a child is selected at random, find the probability that the child has blonde hair or brown eyes.

3. The data from a survey of 140 students showed that 37 study music, 103 play a sport and 25 do neither. Create a Venn diagram to illustrate the data collected and then determine the probability that if a student is selected at random,
 - a. he or she will study music
 - b. he or she will study music given that he or she plays a sport.

4. The international club at a school has 105 members, many of whom speak multiple languages. The most commonly spoken languages in the club are English, Spanish and Chinese. Use the Venn Diagram below to determine the probability of selecting a student who:
 - a. does not speak English.
 - b. speaks Spanish given that he/she speaks English.
 - c. speaks English given that he/she speaks Chinese.
 - d. speaks Spanish and English but not Chinese.



5. In a class of 260 seniors, 125 study Spanish, 95 study Chemistry, 165 study Mathematics, 18 study Spanish and Chemistry, 75 study Chemistry and Math, 20 study Math and Spanish and 15 study all three subjects. Make a Venn diagram to illustrate the data and then find the probability that a student selected at random studies:
 - a. just Spanish
 - b. Math and Chemistry but not Spanish
 - c. none of these subjects
 - d. Spanish, given that he/she studies Math

(D) Further Practice with Probability Problems

1. Amber, a college senior, interviews with Acme Corp. and Mills, Inc. The probability of receiving an offer from Acme is 0.35, from Mills is 0.48, and from both is 0.15. Find the probability of receiving an offer from either Acme Corp. or Mills, Inc., but not both.

2. A survey of couples in a city found the following probabilities: The probability that the husband is employed is 0.85, the probability that the wife is employed is 0.60 and the probability that both are employed is 0.55. A couple is selected at random. Find the probability that
 - a. at least one of them is employed.
 - b. neither is employed.

3. Given $P(A \cap B) = 0.4$, $P(A \cap B') = 0.2$ and $P(A' \cap B') = 0.3$, find $P(B)$ and $P(A|B)$.

4. Given $P(A) = 2P(B)$, $P(A \cup B) = 0.8$ and $P(A \cap B) = 0.1$, find $P(A)$.

5. For questions (a), (b), (c), find the indicated probabilities given $P(A) = 0.5$, $P(B) = 0.65$ and $P(A \cup B) = 0.75$.
 - a. $P(A \cap B)$
 - b. $P(A' \cap B')$
 - c. $P(B|A)$

6. For questions (a), (b) and (c), find the indicated probabilities given $P(A) = 0.6$, $P(B) = 0.8$ and $P(A \cup B)' = 0.2$.
 - a. $P(A \cap B')$
 - b. $P(B|A)$
 - c. $P(A|B)$

7. For questions (a), (b) and (c), find the indicated probabilities given $P(A \cap B') = 0.3$, $P(B \cap A') = 0.2$ and $P(A \cup B) = 0.8$.
 - a. $P(A \cap B)$
 - b. $P(A)$
 - c. $P(B|A)$

8. <http://www.stmarycss.ca/parents/teachers/owen/per1/files/1362410425.pdf>