Lesson 47 – Probabilities and Venn Diagrams

Use the Venn Diagram below to answer question #1 – 5.

Rock   Rap

18   11   24

7

8   1

17
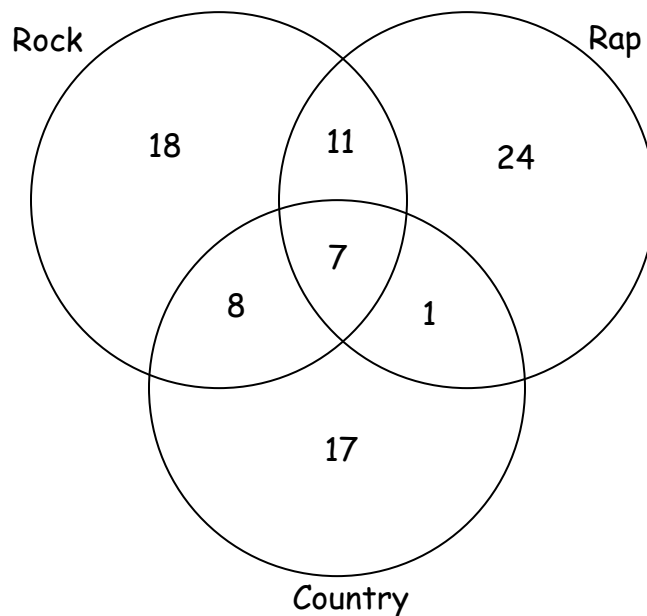
Country

1. How many total people are represented in the diagram? _____

2. How many people like country? _____

3. If one person is chosen at random, what is the probability that that person will like rap music?

    P (rap) =

4. If one person is chosen at random, what is the probability that that person will like country or rock music?

    P(country or rock) =

5. If one person is chosen at random, what is the probability that that person will like country and rock music?

    P(country and rock) =

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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.

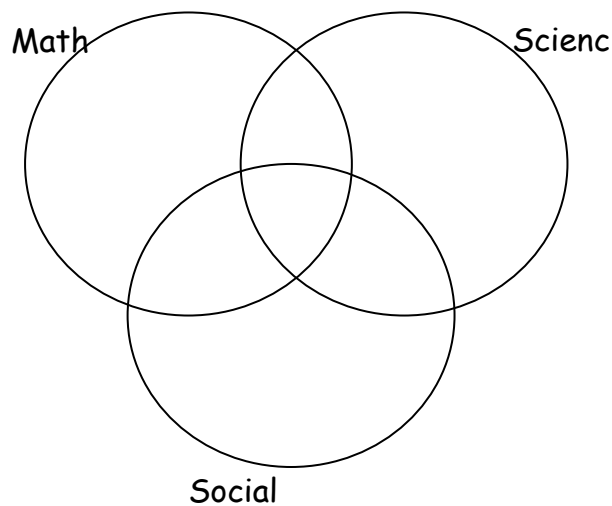56 like Math   18 like Math and Science
43 like Science   10 like Science and Social Studies
35 like Social Studies   12 like Math and Social Studies

6 like all three subjects

Math   Scienc

Social

6. How many people like Math only? _____
7. How many people like Science only? _____
8. If one person is chosen at random, what is the probability that that person will like Science and Math? _____.
9. If one person is chosen at random, what is the probability that that person will like only Math? _____.
10. If one person is chosen at random, what is the probability that that person will not like Science? _____.
11. If one person is chosen at random, what is the probability that that person will like Science or Math? _____.
12. If one person is chosen at random, what is the probability that that person will like Science but not math? _____.

1. In a survey of 2140 teachers in a certain metropolitan area conducted by a nonprofit regarding teacher attitudes, the following data were obtained:

    i. 900 said that lack of parental support is a problem.
    ii. 890 said that abused or neglected children are problems.
    iii. 680 said that malnutrition or students in poor health is a problem.
    iv. 120 said that lack of parental support and abused or neglected children are problems.
    v. 110 said that lack of parental support and malnutrition or poor health are problems.
    vi. 140 said that abused or neglected children and malnutrition or poor health are problems.
    vii. 40 said that all three issues are problems.

    b. Draw a Venn diagram and then find the probability that a teacher selected at random from this group   said that lack of parental support is the only problem hampering a student's schooling?

2. 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.

3. 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.

4. 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.

5. A survey of couples in a city found the following probabilities:

    a. The probability that the husband is employed is 0.85.
    b. The probability that the wife is employed is 0.60.
    c. The probability that both are employed is 0.55.

A couple is selected at random. Find the probability that

    d. at least one of them is employed.
    e. neither is employed.