

Worksheet 12.5: Application of Sets I

Draw a Venn diagram to obtain the answers to the questions in each of the following problems.

1. A survey was taken at FRA to determine where students studied. Of 160 students surveyed, it was determined that

79 studied at school

65 studied at home

43 studied both at school and at home

Of those interviewed,

- how many studied only at school?
- how many studied only at home?
- how many did not study at either location?

2. A travel agent interviewed 180 people to determine whether they preferred traveling long distances by airplane or by automobile and learned that

120 preferred to travel by airplane

90 preferred to travel by automobile

50 preferred to travel by both airplane and automobile

Of those interviewed,

- how many preferred to travel only by airplane?
- how many preferred to travel only by automobile?
- how many preferred not to travel by airplane or automobile?

3. In San Diego, California, a sample of 444 businesses was surveyed to determine which

overnight mailing services they used. The following information was determined.

189 used Federal Express
205 used United Parcel Service
122 used Airborne
57 used Federal Express and United Parcel Service
34 used Federal Express and Airborne
30 used United Parcel Service and Airborne
22 used all three.

How many used

- a) none of these services?
- b) only Airborne?
- c) exactly one of the services?
- d) exactly two of the services?
- e) Federal Express or United Parcel Service?

4. Thirty-three U.S. cities with large populations were surveyed to determine whether they had a professional baseball team, a professional football team, or a professional basketball team. The following information was determined.

16 had baseball
17 had football
15 had basketball
11 had baseball and football
7 had baseball and basketball
9 had football and basketball
5 had all three teams

How many had

- a) only a football team?
- b) baseball and football, but not basketball?
- c) baseball or football?
- d) baseball or football, but not basketball?
- e) exactly two teams?

5. The *People Almanac* performs an annual survey on celebrities. Subscribers are given a list of celebrities and asked to indicate which of the following categories each celebrity belongs to: most powerful, most liked, most trustworthy. From 80 celebrities considered, the following information is determined.

26 were placed on the most powerful list

32 were placed on the most liked list

29 were placed on the most trustworthy list

7 were placed on the most powerful list and the most liked list

8 were placed on the most powerful list and the most trustworthy list

12 were placed on the most liked list and the most trustworthy list

4 were placed on all three list

How many were on

- a) only the most trustworthy list?
- b) exactly one of the lists?
- c) at least one of the lists?
- d) exactly two of the lists?
- e) none of the lists?