Problem-Solving Strategy: Use Venn Diagrams

You can often use a Venn diagram to illustrate data. A rectangle is used to represent all the data. Circles inside the rectangle are used to represent groups of data. The region where intersecting circles overlap represents data that is common to more than one group.

EXAMPLE

The freshman science classes were surveyed to see whether they wanted to visit the local natural history museum or a nearby state park. They could choose the museum, the park, both, or neither. The results of the survey are shown in the Venn diagram at the right. If 96 students were surveyed, how many wanted to go only to the state park?

From the diagram, you know that 27 students wanted to go to both the park and the museum, 46 wanted to go to the museum only, and 12 wanted to go to neither place, so, 96 = (27 + 46 + 12) or 11 students wanted to go the park only.

PRACTICE

Solve. Use any strategy.

1. The Venn diagram at the right shows the three types of food ingredients students picked as things they like in a dessert: nuts, fruit, and chocolate.
   a. How many students like desserts with only nuts and chocolate?
   b. How many students would like a combination of all three ingredients in a dessert?
   c. How many students like only desserts with nuts?
   d. How many students were polled in the survey?

2. Of 180 people who were asked if they had watched recent college basketball playoffs, 38 watched only game 1, 56 watched game 2, and 64 watched game 3. 20 people watched both game 2 and 3. Make a Venn diagram for this situation. How many people did not watch any of the games?

3. Geography A travel agency surveyed 160 of its clients to see where most people would like to go on a vacation. Of these, 55 indicated they would like to visit Zimbabwe, 37 wanted to go to New Zealand, and 29 wanted to go to Peru. 20 of the people who wanted to visit Zimbabwe and 12 of the people who wanted to see New Zealand also said they would like to see Peru. Is it possible to construct a Venn diagram for this information as given? Explain.

4. Standardized Test Practice Using the Venn diagram in Exercise 1, how many people just like fruit to eat?
   A 13 people    B 23 people    C 30 people    D 33 people

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Venn Diagrams

Venn Diagram—a graphic representation that shows relationships between sets of data.

Use words from the box below to complete the Venn diagram.

- regular pentagon
- rectangle
- square
- isosceles triangle
- trapezoid
- right triangle
- regular octagon
- acute triangle
- equilateral triangle

Right Angle

Obtuse Angle

Acute Angle
Venn Diagrams

Use the shapes from the box below to complete the Venn diagram.

Quadrilateral

Regular Polygon

Concave Polygon
**Page 93**

- **Right Angle**
- **Obtuse Angle**
- **Square**
- **Rectangle**
- **Regular Pentagon**
- **Regular Octagon**
- **Trapezoid**
- **Isosceles Triangle**
- **Right Triangle**
- **Acute Triangle**
- **Equilateral Triangle**

**Page 96**

1. Hexagon
2. Parallelogram or Rhombus

**Page 97**

1. 
2. 

**Page 98**

1. Rectangle
2. Rhombus or Square

**Page 99**

1. (-7, 0); 2. (-4, -7); 3. (-1, -7); 4. (6, -2); 5. (-3, 3);
6. (2, 1); 7. (4, 6); 8. (9, 4); 9. (-4, 8); 10. (-3, -2)

**Page 100**

A PIECE OF CHOCOLATE PIE