

Sample Problems on Set Operations

Problem 1: Ice Cream Cones

There are two types of ice cream cones, chocolate and vanilla. You and 24 of your friends (25 total people) are going to buy ice cream cones. If 15 people buy vanilla cones, and 20 people buy chocolate cones, how many people bought both chocolate and vanilla ice cream cones?

Problem 2: Candy Bars

A group of 50 people go to the candy store to buy candy bars. Each person buys at least one bar. The store sells two types of candy bars, Sweet and Tasty. If 45 people buy both types of Candy Bars, and 47 people buy at least one Sweet bar each, how many people bought only Tasty candy bars?

Problem 3: Alien Invasion

A group of 100 aliens arrive on Starship 2000 to invade your planet. These aliens are characterized by two distinct features, their eyes and their tails. Some aliens have eyes but no tail, some have a tail but no eyes, and some have eyes and a tail. If there are 75 aliens that have eyes, and 50 aliens that have eyes and a tail, how many aliens have eyes but no tail? How many have only a tail but no eyes?

Problem 4: Trip to the Zoo

A group of 30 students decides to go on a field trip to the zoo. There are two main exhibits open for visitation, the aviary and the mountain lion habitat. Eight students visit the aviary, six of which also visit the mountain lion habitat. How many students visit only the mountain lion habitat? How many students visit only the aviary?

Problem 5: Costume party

There are 70 children in the town of Smallville, all of whom plan to dress up for a party. There are two activities for the party night, a dance and a costume contest. If 30 children went both dancing and to the contest, and 24 children went only dancing, how many total children participated in the contest? How many went only to the contest?

Problem 6: Movies

There are two movies playing at a local movie theater, *Amazing Fiction 3* and *Math in the Stars*. 68 total people went to the movie theater. If 35 people saw *Math in the Stars*, and 10 saw both *Amazing Fiction 3* and *Math in the Stars*, how many people saw only *Amazing Fiction 3*? How many total tickets were sold at the movie theater?

Problem 7: Drinks

75 drink orders are made in a restaurant, and there are two types of drinks: orange juice and milk. If 59 people drink orange juice and 18 people drink milk, how many people drank both milk and orange juice?

Problem 8: Sports

There are 100 athletes and three different seasons when sports are offered: soccer in the fall, basketball in the winter, and baseball in the spring. Some of the athletes play only one sport, some play two sports, and some play all three. Forty people play soccer. If 15 play all three sports, five play basketball and soccer but not baseball, and 10 play soccer only, how many people play both baseball and soccer?

Problem 9: Pets

There are 49 people that own pets. 15 people own only dogs, 10 people own only cats, five people own only cats and dogs, and 3 people own cats, dogs, and snakes. How many total snakes are there?

Problem 10: Computer Games

Three popular computer games are Alien Invaders, Racecar Derby, and Football Deluxe. Fifty people in your neighborhood own computer games. Sixteen of them own all three games, five own only Racecar Derby, seven own only Football Deluxe, and 19 own only Alien Invasion. How many total computer games are owned in your neighborhood?

Answers:

Answer 1: No less than 10 people, no more than 15 people

Answer 2: 3 people

Answer 3: 25 aliens have eyes but no tail. 25 aliens have only a tail.

Answer 4: 0 to 22 students visit only the mountain lion habitat (depending on how many people visit none). 2 students visit only the aviary.

Answer 5: 46 children participated in the contest. 16 went only to the contest.

Answer 6: 33 people have seen only *Amazing Fiction 3*. 78 total tickets were sold at the movie theater.

Answer 7: 2 people

Answer 8: 25 people

Answer 9: 19 snakes

Answer 10: 85 total computer games