

Section 1.4: Applications of Set Theory

Example 1:

There are 25 dogs at the dog show.

12 dogs are black, 8 dogs have a short tail, 15 dogs have long hair

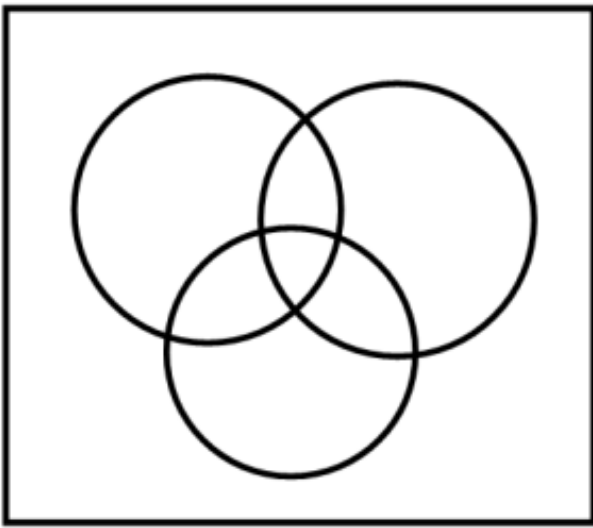
1 dog is black with a short tail and long hair

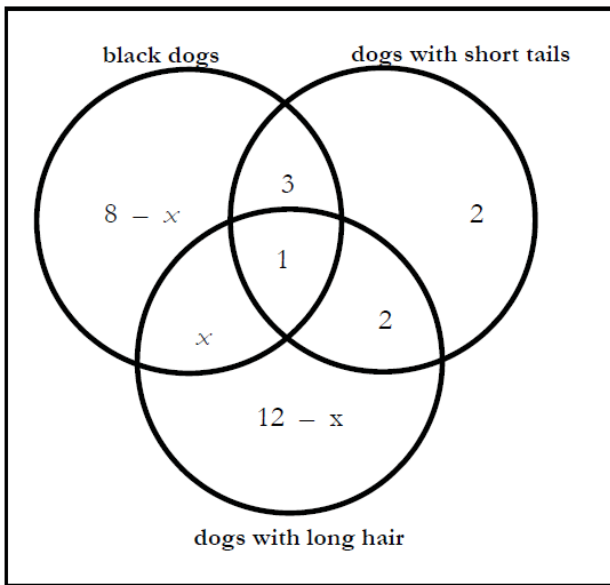
3 dogs are black with short tails but do not have long hair

2 dogs have short tails and long hair but are not black

If all the dogs in the kennel have at least one of the mentioned characteristics, how many dogs are black with long hair but do not have short tails?

$$x = 3$$





$$(8 - x) + (x) + 4 + 4 + (12 - x) = 25$$

$$28 - x = 25$$

$$x = 3$$

Example 2:

28 children have a dog, a cat, or a bird

13 children have a dog, 13 children have a cat, 13 children have a bird

4 children have only a dog and a cat

3 children have only a dog and a bird

2 children have only a cat and a bird

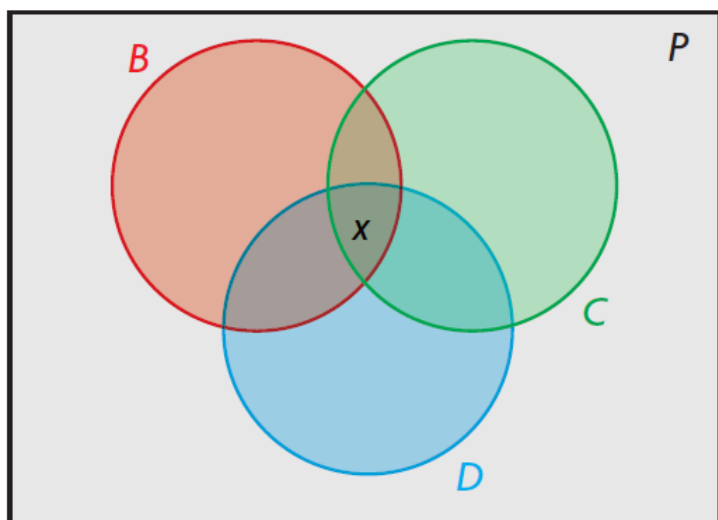
No child has two of each type of pet.

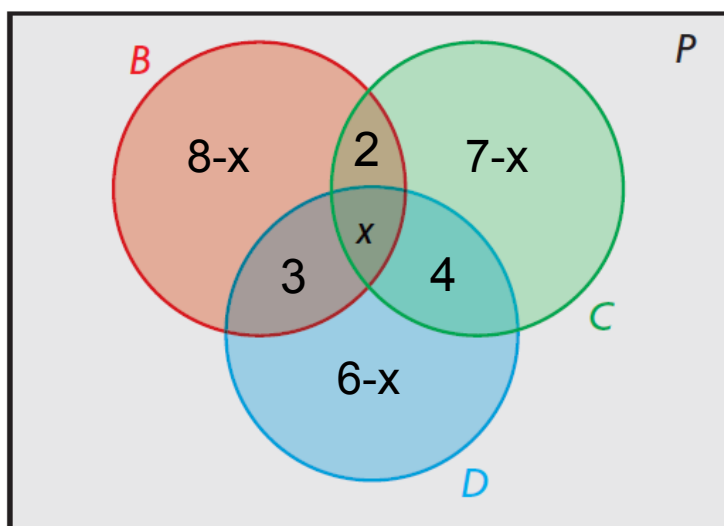
a) How many children have a cat, a dog, and a bird?

①

b) How many children have only one pet?

$$7 + 6 + 5 = 18$$





a) Children with all three pets

$$(8-x) + (7-x) + (6-x) + 9 + x = 28$$

$$30 - 2x = 28$$

$$2x = 2$$

$$x = 1$$

b) Children with one pet

$$= 28 - (1 + 2 + 3 + 4)$$

$$= 28 - 10$$

$$= 18$$

Assign:

p. 51 - 54,
#2, 4, 6, 9, 13, 14

