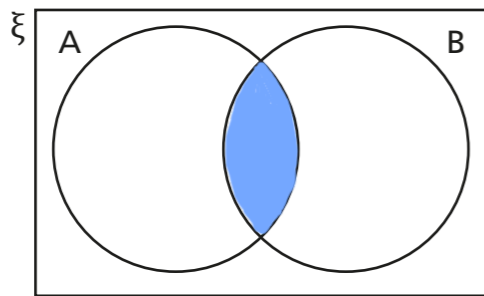# Understand and use the intersection of sets
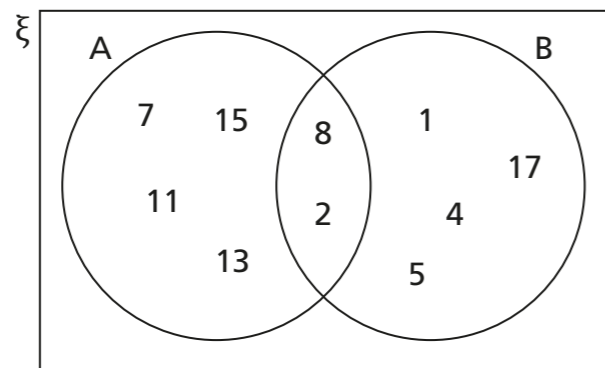
1 Here are two sets: A and B.

ξ A   B

a) Shade the region that represents A ∩ B.

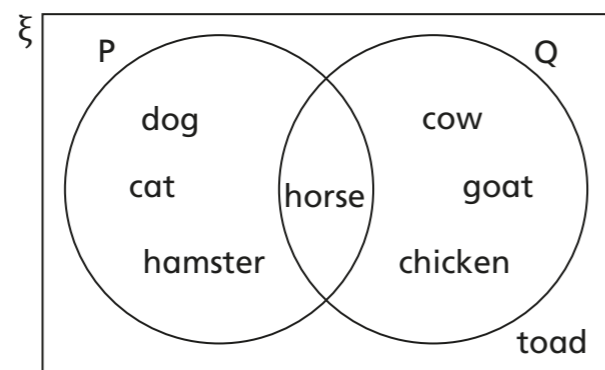**b)** Describe what A ∩ B means.

It's the set containing all the elements that are
in set A AND set B.

2 **a)**

ξ A   B

7   15   8   1
              17
11   2   4
    13   5

Write the elements of A ∩ B.   2, 8

b)

ξ P   Q

dog   cow
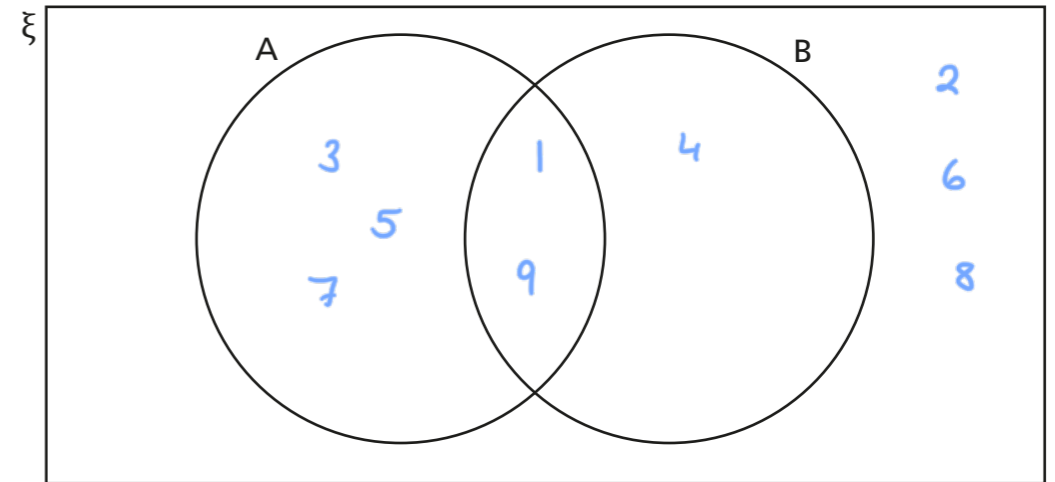cat   horse   goat
hamster   chicken
                toad

Write the element of P ∩ Q.   horse

3

ξ = {1, 2, 3, 4, 5, 6, 7, 8, 9}

A = {1, 3, 5, 7, 9}

B = {1, 4, 9}

a) Complete the Venn diagram to show the information.

ξ A   B   2

3   1   4   6
  5
7   9   8

b) Use your Venn diagram to work out A ∩ B.   1   9

c) Which description best describes the elements of A ∩ B?

Tick your answer.

square numbers ☐   odd square numbers ☑

even numbers ☐   odd numbers ☐

4

A = {0, 5, 10, 15, 20, 25, 30}
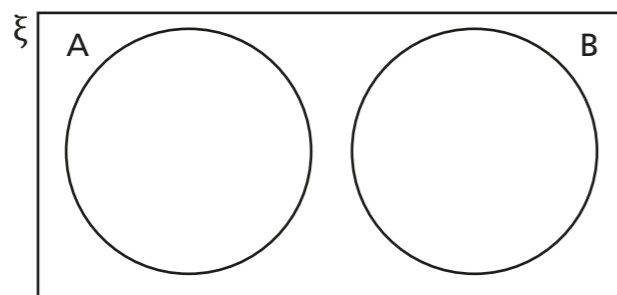
B = {0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20}

a) Work out the elements of A ∩ B.   0, 10, 20

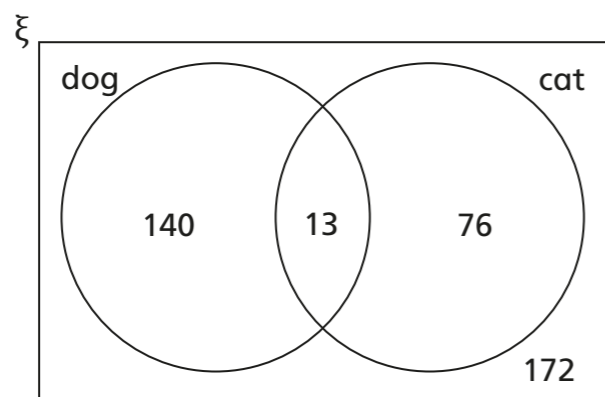**b)** Discuss with a partner how to describe the members of A ∩ B.

5 Explain why the Venn diagram represents the information.

ξ = {letters of the alphabet}

A = {consonants}

B = {vowels}

ξ   A ◯   B ◯

There is no intersection. A letter is either a vowel or a consonant, it can't be both.

6 The Venn diagram shows the number of students in a school who own a cat or a dog.

ξ

dog ◯ cat
140   13   76

172

a) How many students own a cat and a dog?

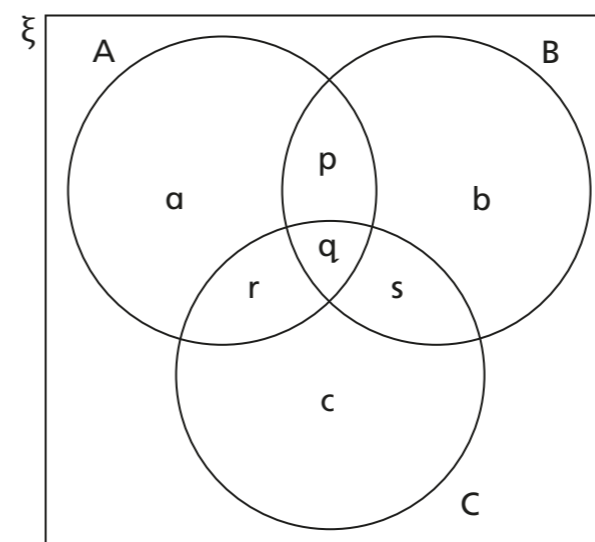13

b) How many students own a dog?

153

c) How many students do not own a cat?

312

7 Here are three sets: A, B and C.

Some letters have been placed in different regions.

ξ   A   B
       p
   a   b
       q
    r   s
       c
             C

List the elements of:

a) A ∩ B = {__p, q__}

c) B ∩ C = {__q, s__}

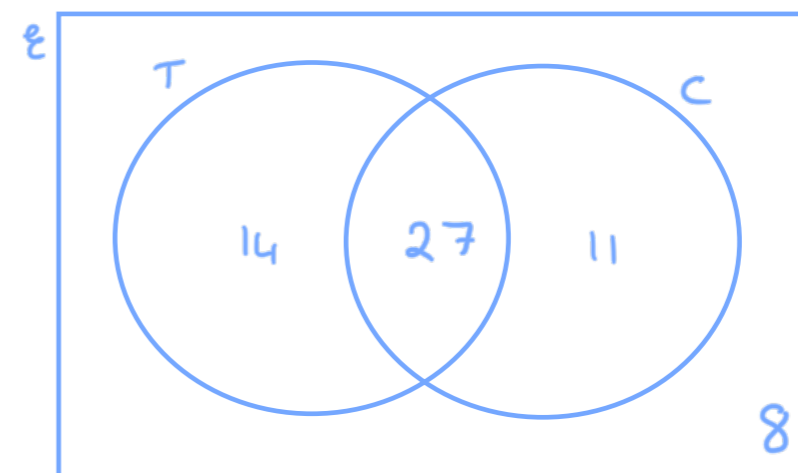**b)** A ∩ C = {__q, r__}

d) (A ∩ B) ∩ C = {__q__}

8 60 people were asked whether they liked tea and coffee.

The results are shown in the two-way table.

	Like	Do not like
Tea	41	19
Coffee	38	22

27 people like both tea and coffee.

a) Draw a Venn diagram to represent this information.

ξ
   T   C
   14   27   11
             8

b) How many people do not like tea or coffee?

8