# Probability from a Venn diagram using further set notation (2 sets)

Maths

Mrs Dennett

Probability from Venn diagrams (2 sets)

1. The Venn diagram shows the number of students who have a mobile phone and laptop.

ξ

L   M

11   4   8

8
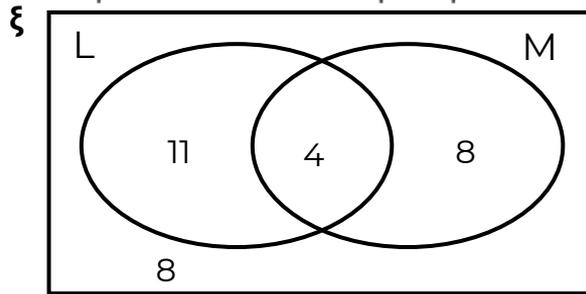
a) Work out P(M)
b) Work out P(L ∩ M)
c) Work out P(L ∪ M)
d) Work out P(L')

2. The Venn diagram shows a set of numbers.
ξ= {1,2,3,4,5,6,7,8,9,10,12,13,14,15}
A = {Prime numbers} B= {Multiples of 2}

ξ

A   B

3   5   4   6   14
7   13   2   8
11   12   10
1   9   15
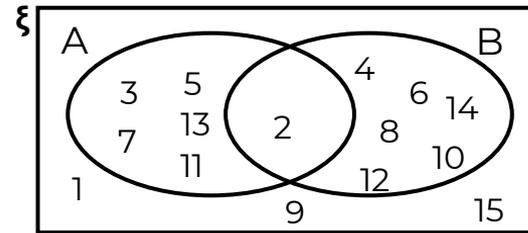
a) Work out P(B')
b) Work out P(A' ∩ B)
c) Work out P(A ∪ B')
d) Work out P(A' ∪ B')

Probability from Venn diagrams (2 sets)

3. The Venn diagram shows the number of students who have a cat and dog.

ξ

C   D

7   7   4

5
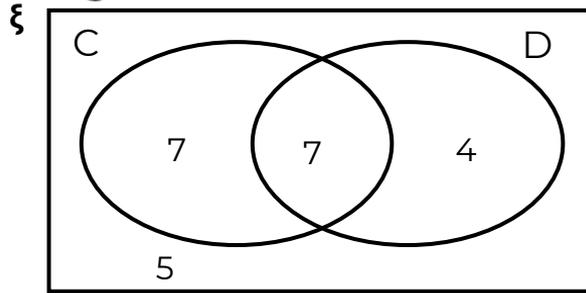
a) Work out P(D)

b) Work out P(C ∩ D)

c) Work out P(C ∩ D |D)

d) Work out P(C ∩ D |C)

4. Adam completed a survey of 100 students to find out how many had a bicycle and if they played for a sports team.

64 students had a bicycle. 35 had a bicycle and played on a sports team. 24 do not have a bicycle or play on a sports team.

a) Draw a Venn diagram for Adam's data.

b) Work out the probability a student plays on a sport team given they have a bicycle.

Answers

Probability from Venn diagrams (2 sets)

1. The Venn diagram shows the number of students who have a mobile phone and laptop.

ξ

L   M

11   4   8

8
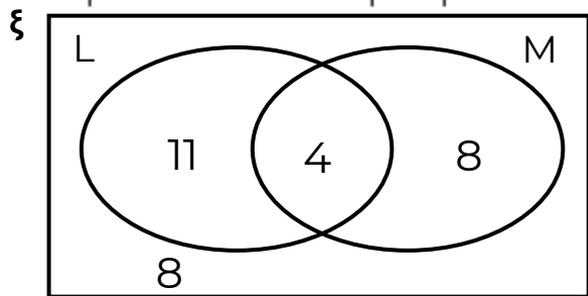
a) Work out P(M) $\frac{12}{31}$
b) Work out P(L ∩ M) $\frac{4}{31}$
c) Work out P(L ∪ M) $\frac{23}{31}$
d) Work out P(L') $\frac{16}{31}$

2. The Venn diagram shows a set of numbers.
ξ= {1,2,3,4,5,6,7,8,9,10,12,13,14,15}
A = {Prime numbers} B= {Multiples of 2}

ξ

A   B

3   5   4   6   14
7   13   2   8
    11   12   10
1   15
        9
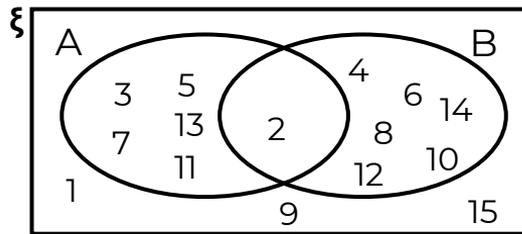
a) Work out P(B') $\frac{8}{15}$
b) Work out P(A' ∩ B) $\frac{6}{15}$
c) Work out P(A ∪ B') $\frac{9}{15}$
d) Work out P(A' ∪ B') $\frac{3}{15}$

Probability from Venn diagrams (2 sets)

3. The Venn diagram shows the number of students who have a cat and dog.

ξ

C   D

7   7   4

5
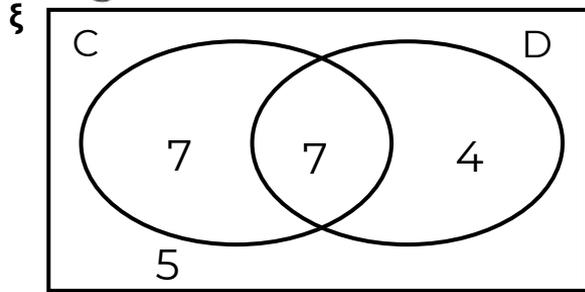
a) Work out P(D) $\frac{11}{23}$

b) Work out P(C ∩ D) $\frac{7}{23}$

c) Work out P(C ∩ D |D) $\frac{7}{11}$

d) Work out P(C ∩ D |C) $\frac{7}{14}$

4. Adam completed a survey of 100 students to find out how many had a bicycle and if they played for a sports team.

64 students had a bicycle. 35 had a bicycle and played on a sports team. 24 do not have a bicycle or play on a sports team.

a) ξ

B   S

29   35   12

24

b) Work out the probability a student plays on a sport team given they have a bicycle.

$\frac{35}{64}$