VENN DIAGRAMS

Pearson Edexcel - Thursday 4 June 2020 - Paper 2 (Calculator) Foundation Tier
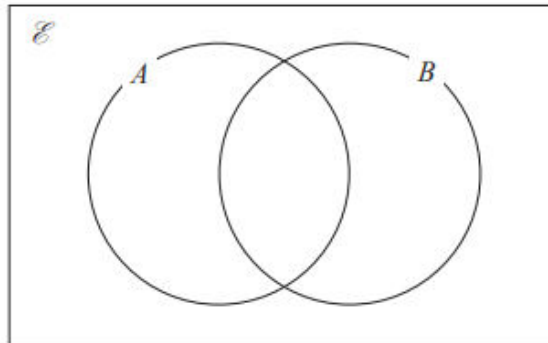
1.

22 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{even numbers}\}$
$B = \{\text{factors of } 10\}$

(a) Complete the Venn diagram for this information.

(3)

A number is chosen at random from the universal set, $\mathscr{E}$

(b) Find the probability that this number is in the set $A \cap B$

(2)

(Total for Question 22 is 5 marks)

2.

24 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$
$A = \{1, 5, 6, 8, 9\}$
$B = \{2, 6, 9\}$

(a) Complete the Venn diagram to represent this information.

(3)

A number is chosen at random from the universal set $\mathscr{E}$.

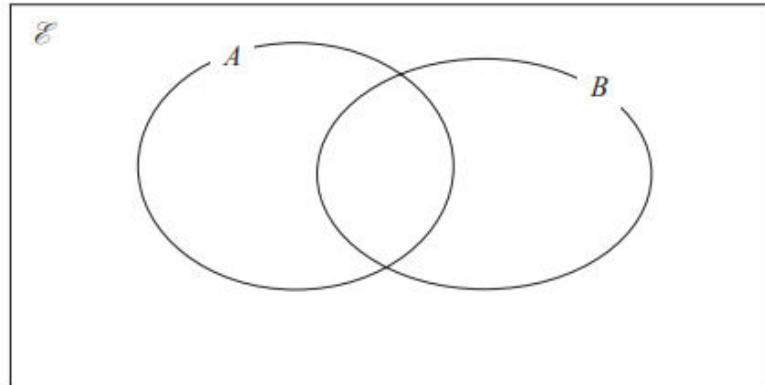(b) Find the probability that the number is in the set $A \cap B$

(2)

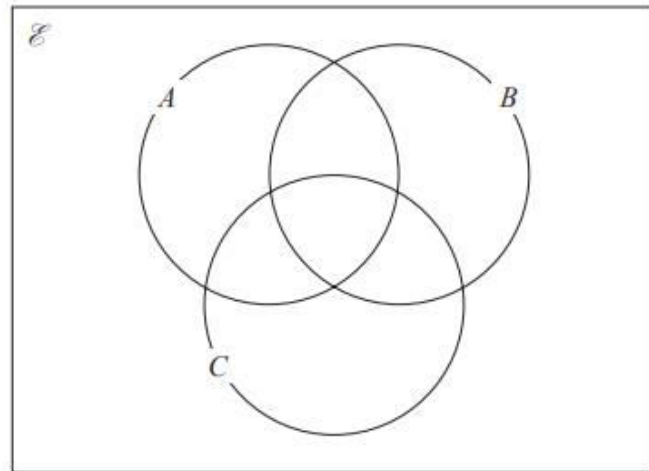**(Total for Question 24 is 5 marks)**

3.

20 $\mathcal{E}$ = {even numbers between 1 and 25}
  A = {2, 8, 10, 14}
  B = {6, 8, 20}
  C = {8, 18, 20, 22}

(a) Complete the Venn diagram for this information.

(4)

A number is chosen at random from $\mathcal{E}$.

(b) Find the probability that the number is a member of $A \cap B$.

....

(2)

(Total for Question 20 is 6 marks)

4.

18 A = {multiples of 5 between 14 and 26}

B = {odd numbers between 14 and 26}

(a) List the members of $A \cup B$

(2)

(b) Describe the members of $A \cap B$

(1)

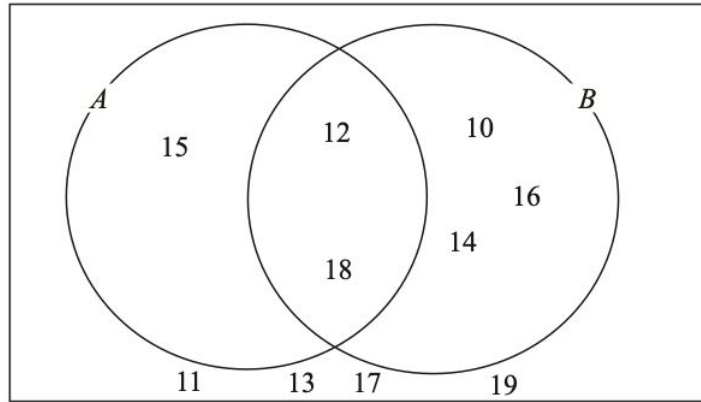**(Total for Question 18 is 3 marks)**

5.

26 Here is a Venn diagram.

(a) Write down the numbers that are in set

   (i) $A \cup B$

   ....

   (ii) $A \cap B$

   ....

   (2)

One of the numbers in the diagram is chosen at random.

(b) Find the probability that the number is in set A'

....

(2)

(Total for Question 26 is 4 marks)

6.

20 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{multiples of 2}\}$
$A \cap B = \{2, 6\}$
$A \cup B = \{1, 2, 3, 4, 6, 8, 9, 10\}$

Draw a Venn diagram for this information.

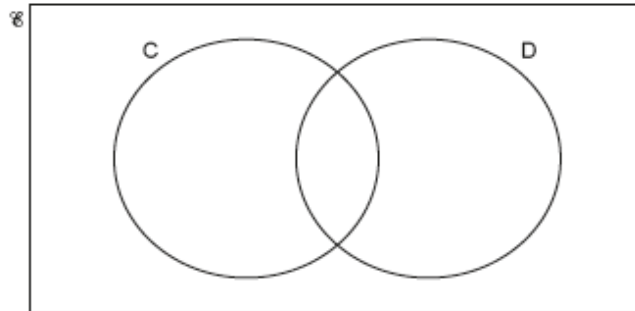**(Total for Question 20 is 4 marks)**

7.

9   59 families are asked whether they have a cat (C) or a dog (D).

- 26 only have a cat.
- 14 only have a dog.
- 11 have both a cat and a dog.

(a)   Show this information on the Venn diagram.

[1]

(b)   **(i)**   How many of the families do not have a cat or a dog?

(b)(i)   .... [1]

(ii)   Write your answer in the correct place on the Venn diagram.   [1]

(c)   One of the families is chosen at random.

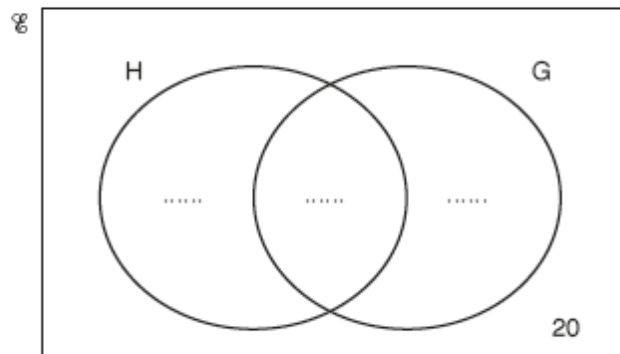Write down the probability that they have a dog.

(c)   .... [2]

8.

22 In a group of 100 students

- 59 study History (H)
- 62 study Geography (G)
- 20 do not study either subject.

(a) Complete the Venn diagram.

[3]

(b) One of the 100 students is selected at random.

Find the probability that this student studies exactly one of the two subjects.
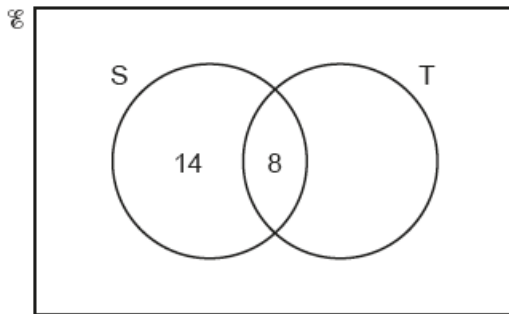
(b) .... [2]

9.

7 A survey asked whether some students went swimming (S) or played tennis (T) last month.

- 17 played tennis.
- 11 did not go swimming and did not play tennis.
- 22 went swimming.
- 8 went swimming and played tennis.

Some of this information is shown on the Venn diagram below.

How many students were in the survey?

.... **[3]**

10.

27 72 children are asked whether they have a laptop or an iPad.
- 31 have a laptop.
- 48 have an iPad.
- 12 have both.
- 5 have neither.

(a) Represent this information on a Venn diagram.

ℰ

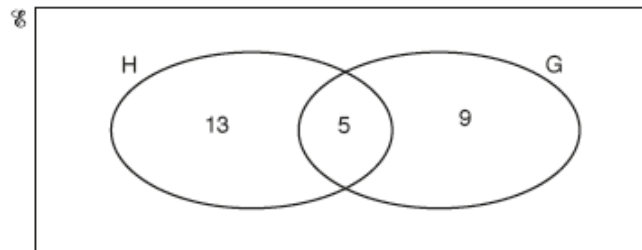[3]

(b) One of the children is chosen at random.

Write down the probability that they have an iPad but not a laptop.

(b) .... [2]

11.

10 (a) This Venn diagram shows the number of students in a Year 10 tutor group who study History (H) and Geography (G).

There are 29 students in the tutor group.

(i) How many students in the tutor group do not study History or Geography?

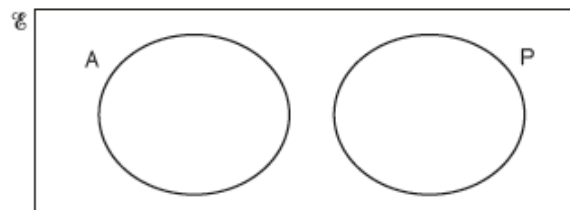(a)(i) .... [2]

(ii) How many students in the tutor group study History?

(ii) .... [1]

(iii) One of the 29 students is selected at random.
What is the probability that they study Geography but do not study History?

(iii) .... [1]

(b) This diagram represents students in a tutor group who study Art (A) and Physics (P).

How many students study both Art and Physics?

(b) .... [1]

12.

6   Here is a Venn diagram.
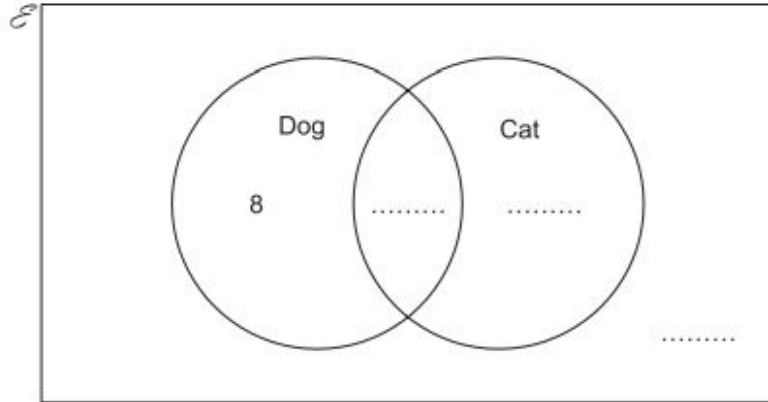
30 students are asked if they have a dog or cat.

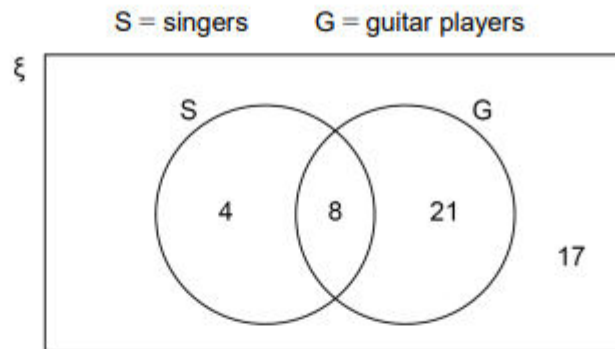- 21 have a dog.
- 16 have a cat.
- 8 have a dog, but not a cat.

Complete the Venn diagram.   **[3]**

13.

12   The Venn diagram shows information about 50 people who are in bands.

S = singers   G = guitar players

12 (a)   How many of the people are guitar players?

[1 mark]

Answer _____

12 (b)   How many of the people are singers but **not** guitar players?

[1 mark]

Answer _____

12 (c)   One of the people is chosen at random.

Write down the probability that the person is
          not a singer
          and
          not a guitar player.

[1 mark]

14.

14   There are 135 passengers on a plane.

3 of the passengers in Business Class are flying for the first time.
In total, there are 15 passengers in Business Class.

$\frac{1}{4}$ of the passengers **not** in Business Class are flying for the first time.
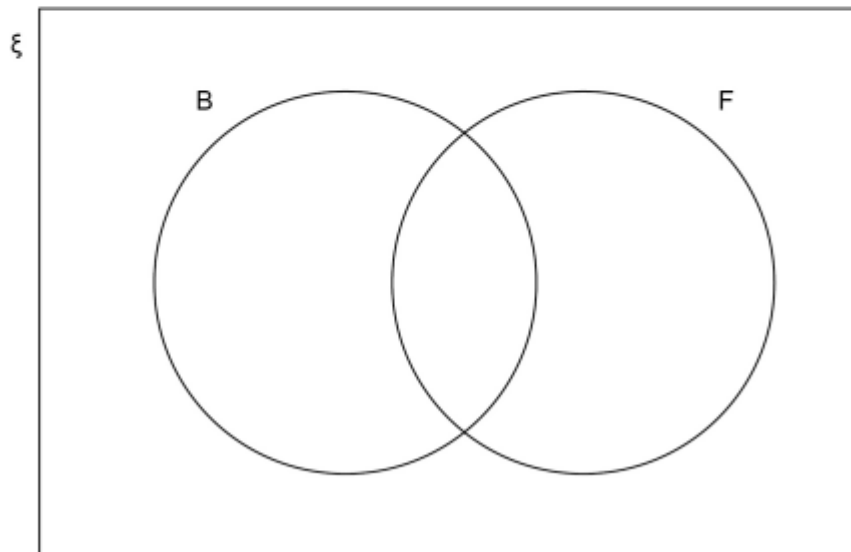
14 (a)   In the Venn diagram,

ξ = passengers on the plane

B = passengers in Business Class

F = passengers flying for the first time.

Complete the Venn diagram.

[4 marks]

14 (b) One of the passengers is chosen at random.

Write down the probability that the passenger is in Business Class.

[1 mark]

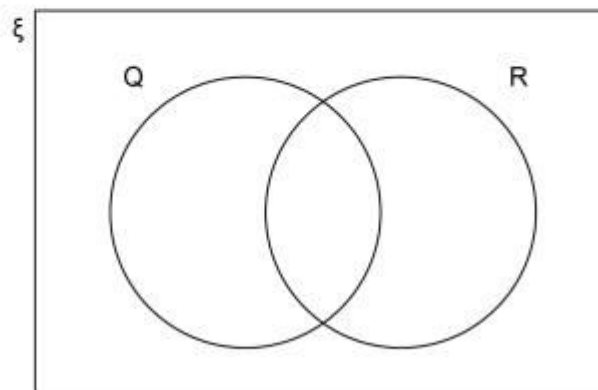Answer _____

15.

18   Here are five shapes, A to E.

A	Parallelogram
B	Regular pentagon
C	Rhombus
D	Scalene triangle
E	Trapezium

In the Venn diagram,

    ξ is the set of all shapes

    Q is the set of quadrilaterals

    R is the set of shapes which **always** have rotational symmetry.

Complete the Venn diagram with the letters A to E.

[3 marks]

16.

16   What does (A ∩ B) represent in   P(A ∩ B) ?
Circle your answer.

[1 mark]

A or B or both   A but not B

not A and not B   A and B
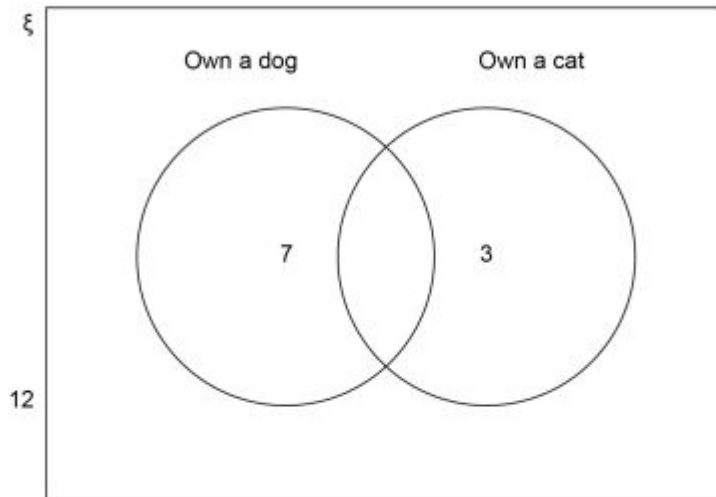
17.

23 In a group of 20 people

      7 own a dog

      3 own a cat

      12 do not own a dog or a cat.

Aidan shows this information on a Venn diagram.

Make **two** criticisms of his Venn diagram.

[2 marks]

Criticism 1 _____

_____

_____

Criticism 2 _____

_____

_____

AQA Wednesday 8 November 2017 – Morning (Calculator) Foundation Tier

    18.

20 In a tennis tournament,

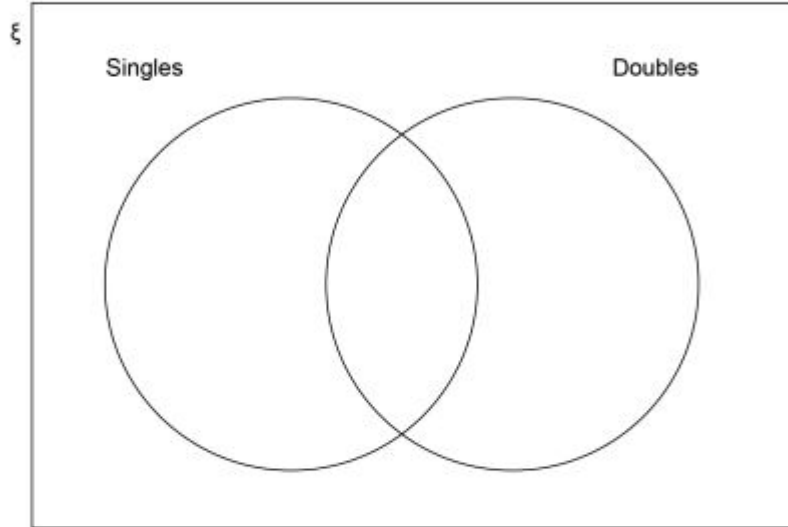98 players took part in the singles only

34 players took part in the doubles only

twice as many players took part in the singles as took part in the doubles.

How many players took part in both the singles **and** the doubles?
You may use the Venn diagram to help you.

[4 marks]

ξ

Singles   Doubles
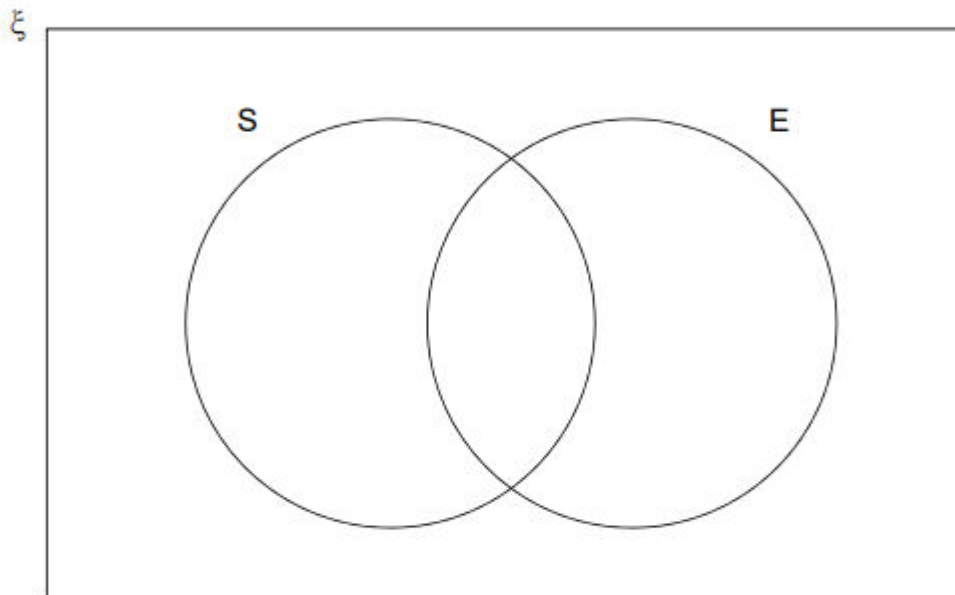
Answer _____

19.

22   ξ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}

S = square numbers

E = even numbers

22 (a)   Complete the Venn diagram.

[3 marks]

22 (b)   One of the numbers is chosen at random.

Write down P (S ∩ E)

[1 mark]

Answer _____