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GCSE MATHS

Probability

Edexcel 1MA1 | Subtopic collection Topic 54

Venn diagrams and set notation

Higher tier

Past paper question booklet

11	2017-2025	Higher
question groups	available papers	tier

Before you begin

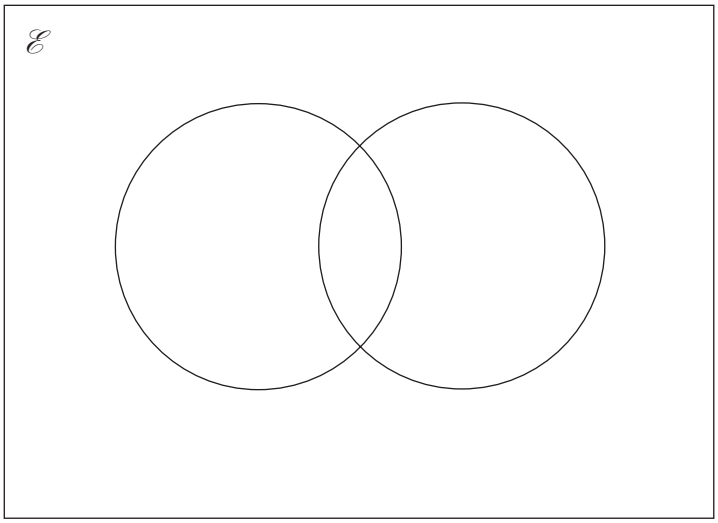
1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

1 $\mathscr{E}$ = {odd numbers less than 30}
A = {3, 9, 15, 21, 27}
B = {5, 15, 25}

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



(4)

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

(b) What is the probability that the number is in the set $A \cup B$?

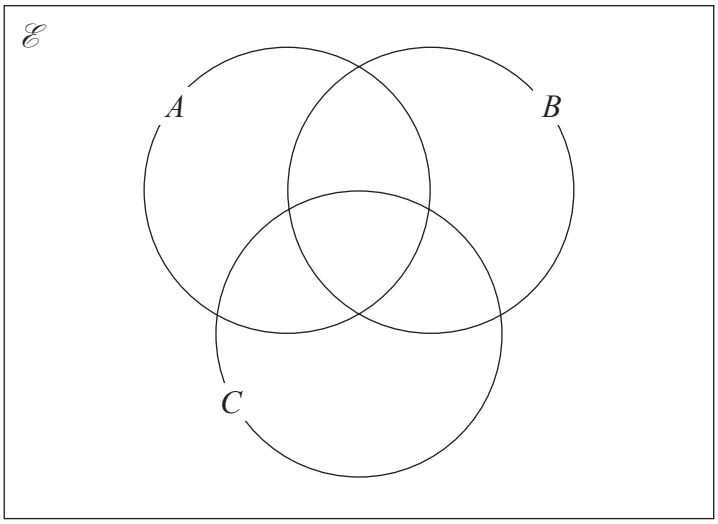
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(2)

(Total for Question 1 is 6 marks)

1 $\mathscr{E}$ = {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 $\mathscr{E}$.

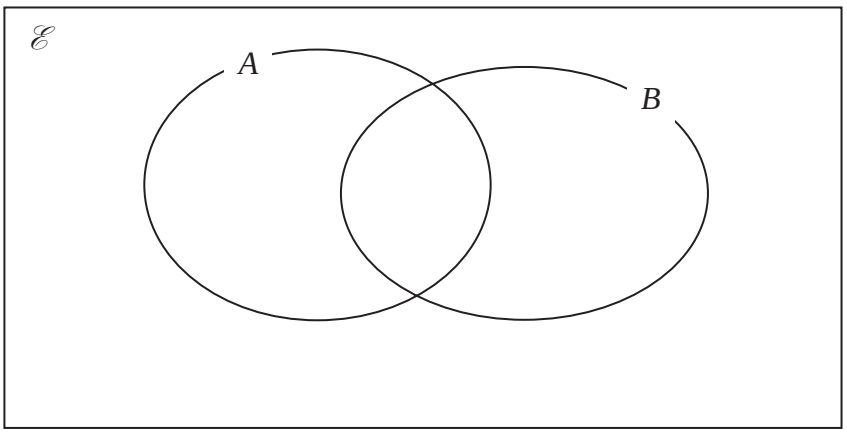
(b) Find the probability that the number is a member of $A \cap B$.

.....

(2)

(Total for Question 1 is 6 marks)

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



(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 $A \cap B$

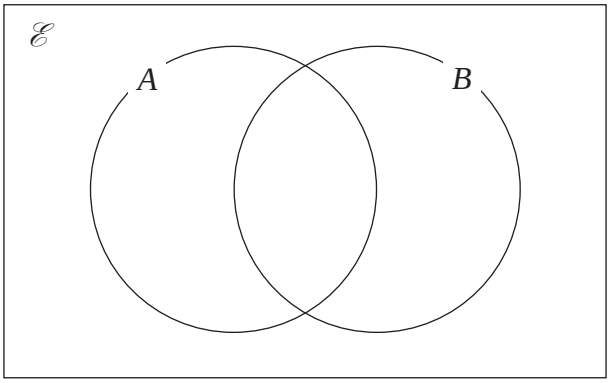
.....

(2)

(Total for Question 1 is 5 marks)

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

(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 $A \cap B$

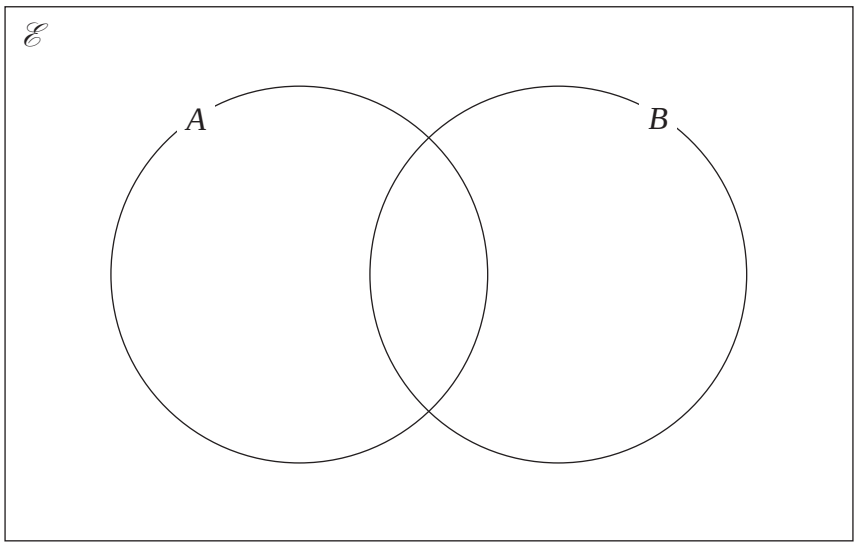
.....

(2)

(Total for Question 2 is 5 marks)

2 $\mathscr{E}$ = {even numbers less than 19}
A = {6, 12, 18}
B = {2, 6, 14, 18}

Complete the Venn diagram for this information.



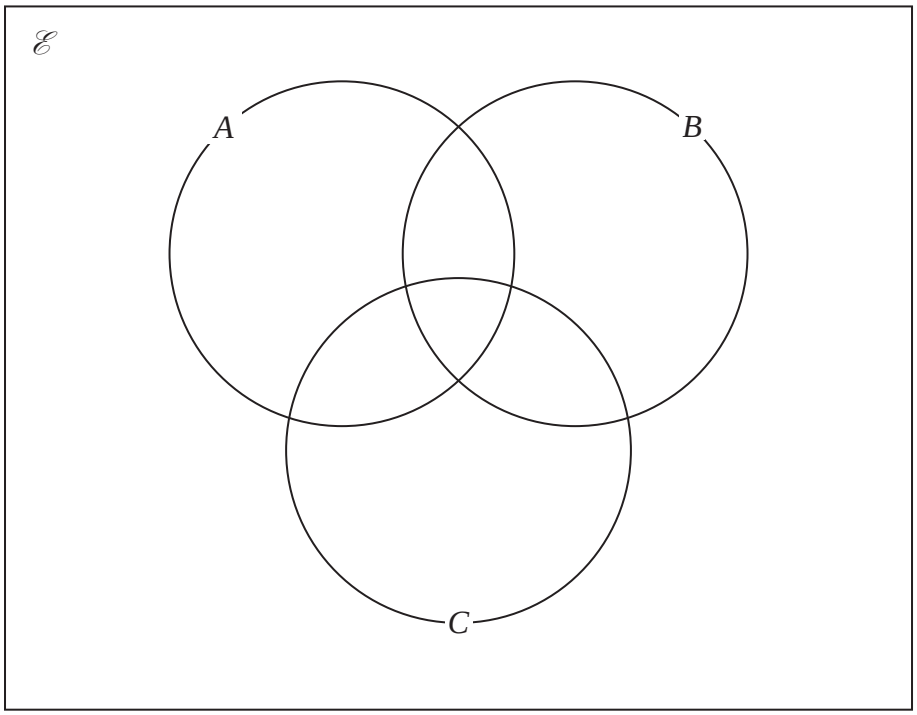
(Total for Question 2 is 3 marks)

16 A shop manager wants to advertise special offers on social media platforms.

The manager asks 100 customers which of type *A*, type *B* or type *C* they use.

Of these customers,
4 use all three types
16 do not use any of type *A*, type *B* or type *C*
8 use both type *A* and type *B*, but not type *C*
14 use both type *B* and type *C*
62 in total use type *A*
all 20 who use type *C* also use at least one of type *A* and type *B*.

(a) Complete the Venn diagram for this information.



(4)

One of the customers is chosen at random.

Given that this customer uses type *A*,

(b) find the probability that this customer also uses type *B*.

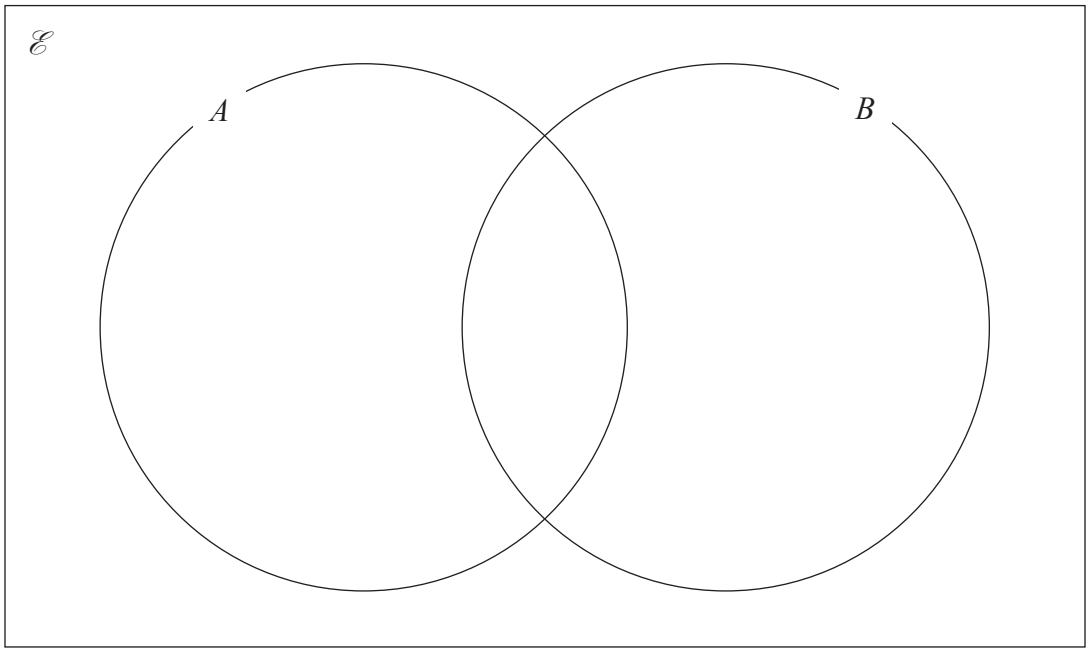
.....

(2)

(Total for Question 16 is 6 marks)

5 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{odd numbers}\}$
$B = \{\text{square numbers}\}$

(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 B'

.....

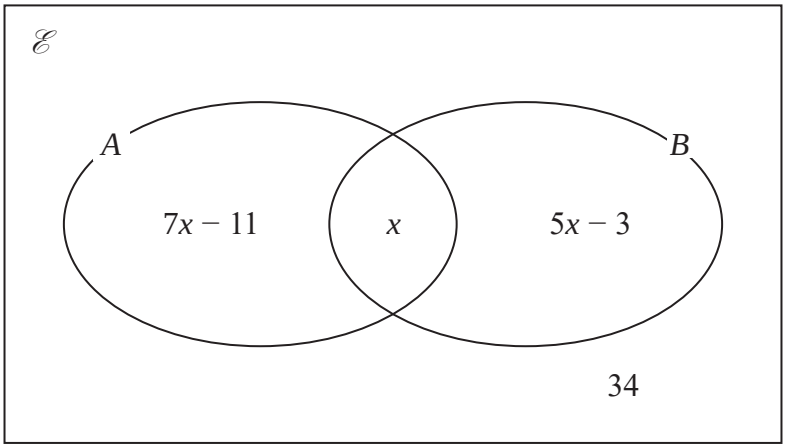
(2)

(Total for Question 5 is 5 marks)

21 Vicky has a collection of medals.

The Venn diagram gives information about the number of medals in her collection where

$\mathscr{E}$ = {all medals}
A = {English medals}
B = {gold medals}



Vicky is going to take at random a medal from her collection.

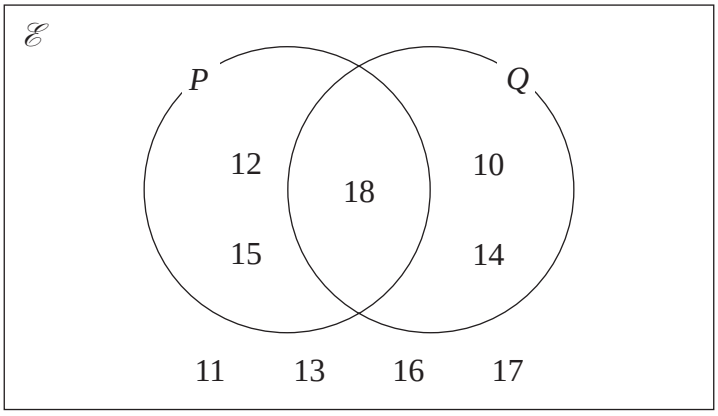
Given that the medal is gold, the probability that the medal is English is $\frac{2}{11}$

Work out the number of medals in Vicky's collection.

.....

(Total for Question 21 is 4 marks)

4 Here is a Venn diagram.



(a) Write down the numbers that are in set P'

.....

(1)

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

(b) Find the probability that this number is in the set $P \cup Q$

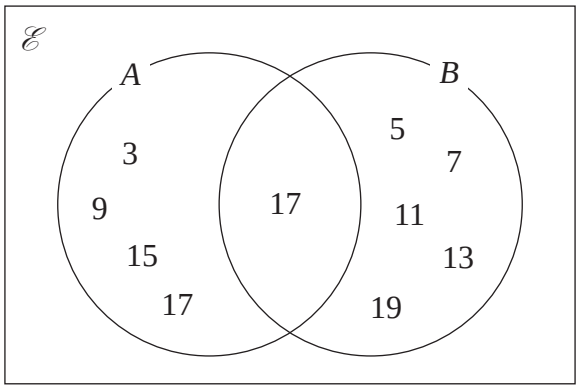
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(2)

(Total for Question 4 is 3 marks)

4 $\mathscr{E}$ = {odd numbers between 0 and 20}
A = {3, 9, 15, 17}
B = {5, 7, 11, 13, 17, 19}

Tom was asked to draw a Venn diagram for this information.
Here is his answer.



Write down two things Tom should do to make his answer fully correct.

1 .....

.....

2 .....

.....

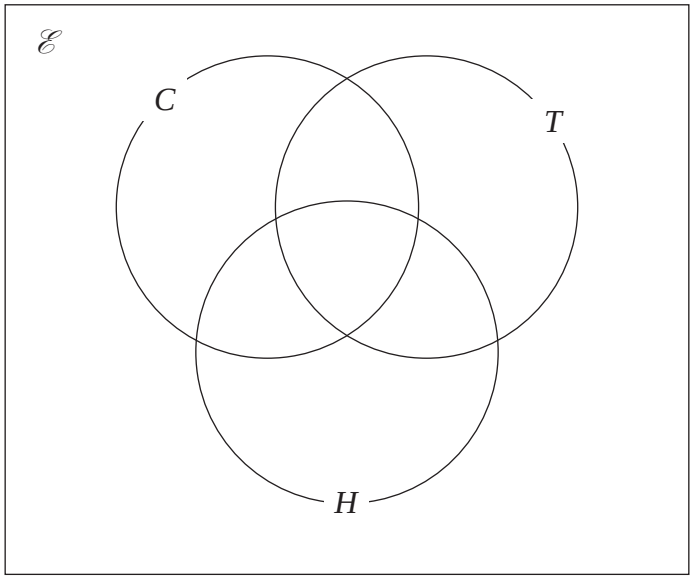
(Total for Question 4 is 2 marks)

18 Magda carried out a survey to find out the drinks that people like.

She asked 100 people if they like coffee (C) or tea (T) or hot chocolate (H).

32 people like all three drinks.
15 people like coffee and hot chocolate but **not** tea.
43 people like coffee and tea.
39 people like tea and hot chocolate.
67 people like coffee.
58 people like hot chocolate.
5 people like **only** tea.

(a) Complete the Venn diagram for this information.



(4)

One of the people is chosen at random.

Given that this person likes coffee,

(b) find the probability that this person also likes hot chocolate.

.....

(2)

(Total for Question 18 is 6 marks)