Name ANSWERS	Class

MATHS TEACHER HUB

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Venn diagrams

(9 – 1) Topic booklet

Foundation

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

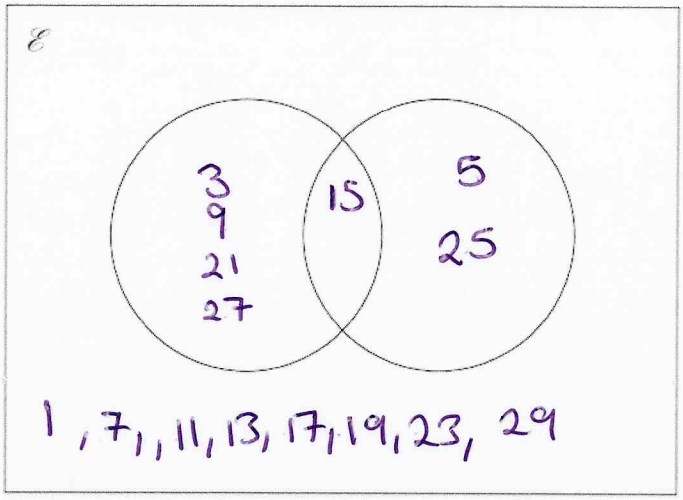
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29,

15 $\mathscr{E}$ = {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 $A \cup B$?

$\frac{7}{15}$

(2)

(Total for Question 15 is 6 marks)

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

B = {odd numbers between 14 and 26}

A = 15, 20, 25

B = 15, 17, 19, 21, 23, 25

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

15, 17, 19, 20, 21, 23, 25

(2)

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

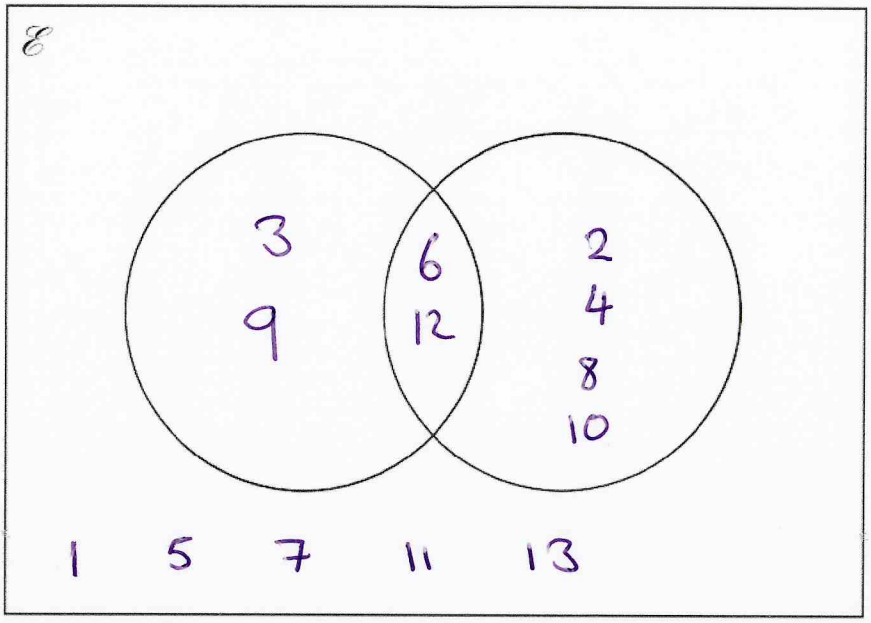
15, 25, = Odd multiples of 5 between 14 and 26

(1)

(Total for Question 18 is 3 marks)

20 $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13}
A = {multiples of 3}
B = {even numbers}

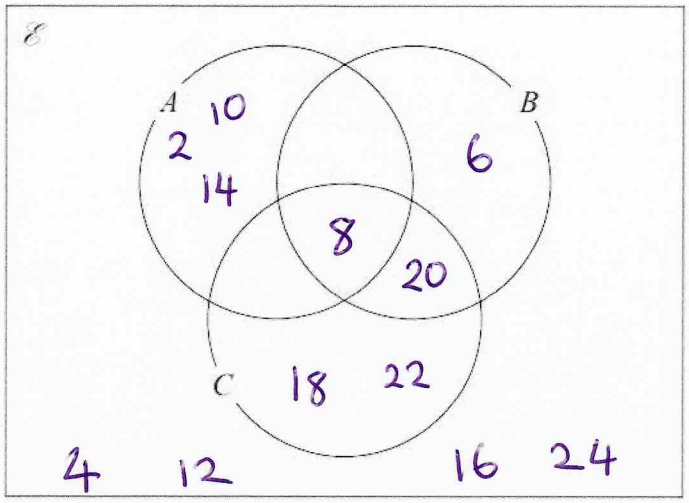
Complete the Venn diagram for this information.



(Total for Question 20 is 4 marks)

20 $\mathscr{E}$ = {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 $A \cap B$.

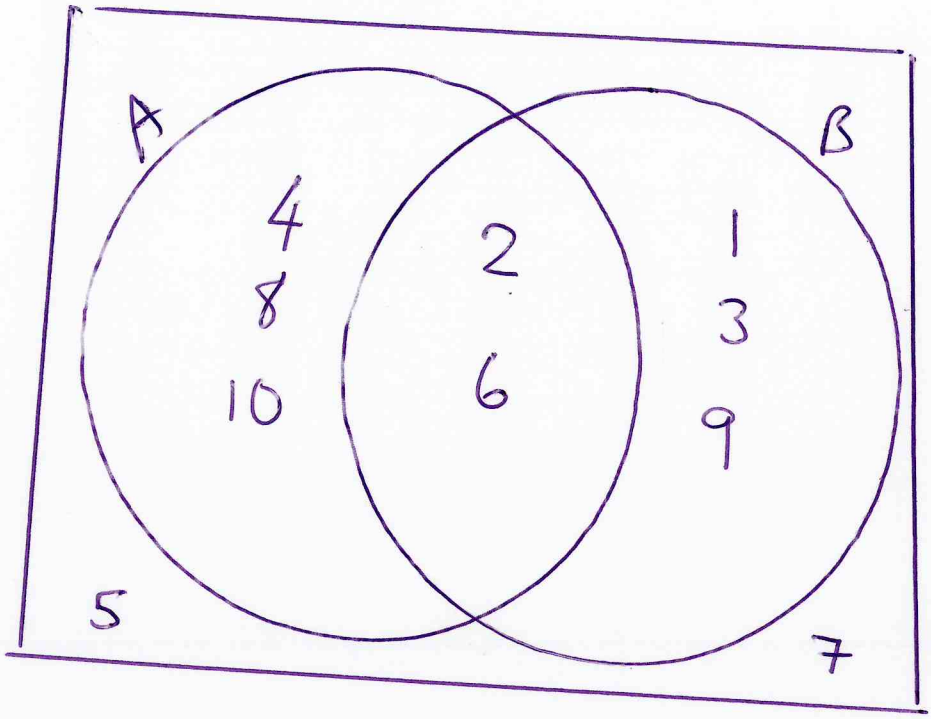
$\frac{1}{12}$

(2)

(Total for Question 20 is 6 marks)

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.

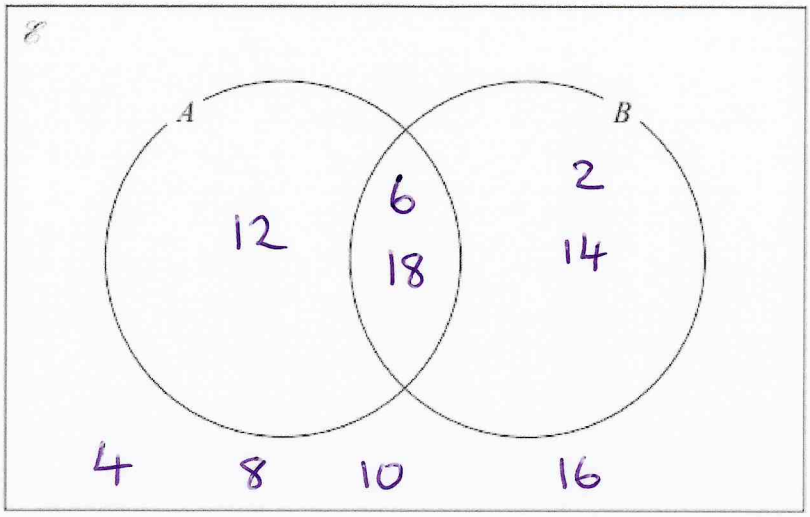


(Total for Question 20 is 4 marks)

21 $\mathscr{E}$ = {even numbers less than 19}
A = {6, 12, 18}
B = {2, 6, 14, 18}

2, 4, 6, 8, 10, 12, 14, 16, 18

Complete the Venn diagram for this information.

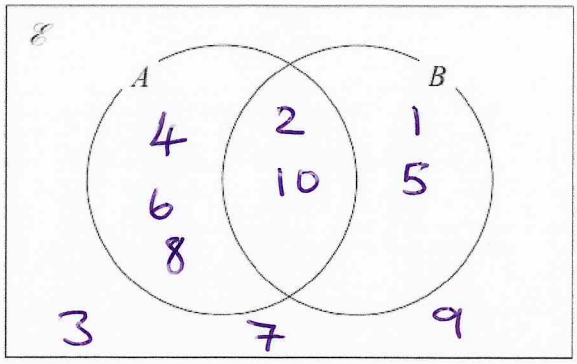


(Total for Question 21 is 3 marks)

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

Factors
1 × 10
2 × 5

(a) Complete the Venn diagram for this information.



(3)

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

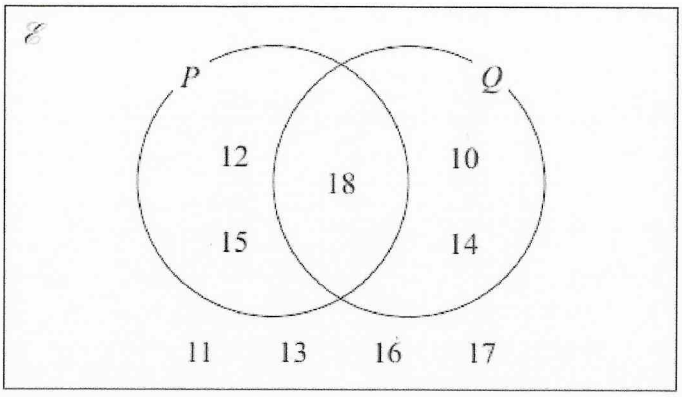
(b) Find the probability that this number is in the set $A \cap B$

$\frac{2}{10} = \frac{1}{5}$

(2)

(Total for Question 22 is 5 marks)

23 Here is a Venn diagram.



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

10, 14, 11, 13, 16, 17

(1)

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

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

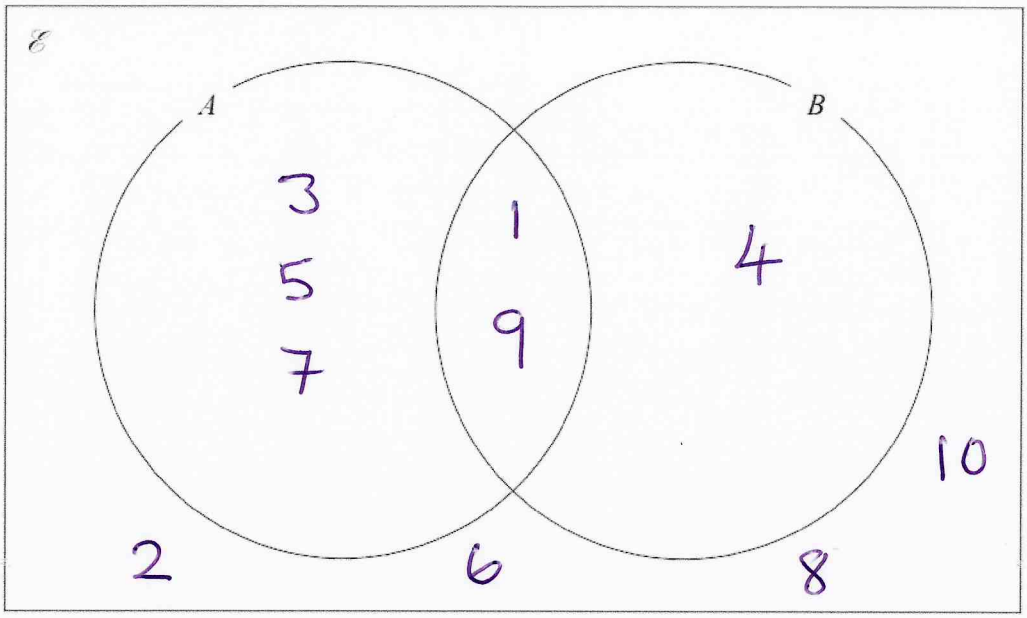
$\frac{5}{9}$

(2)

(Total for Question 23 is 3 marks)

24 $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
A = {odd numbers}
B = {square numbers}

(a) Complete the Venn diagram for this information.



(3)

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

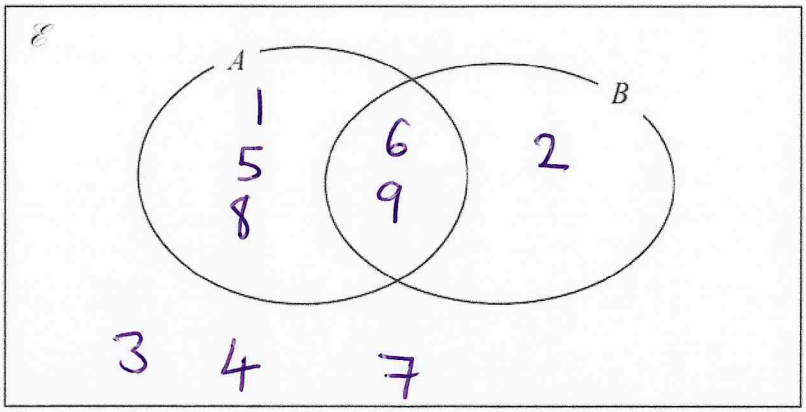
(b) Find the probability that this number is in the set B'

$\frac{7}{10}$

(2)

(Total for Question 24 is 5 marks)

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 $\mathscr{E}$.

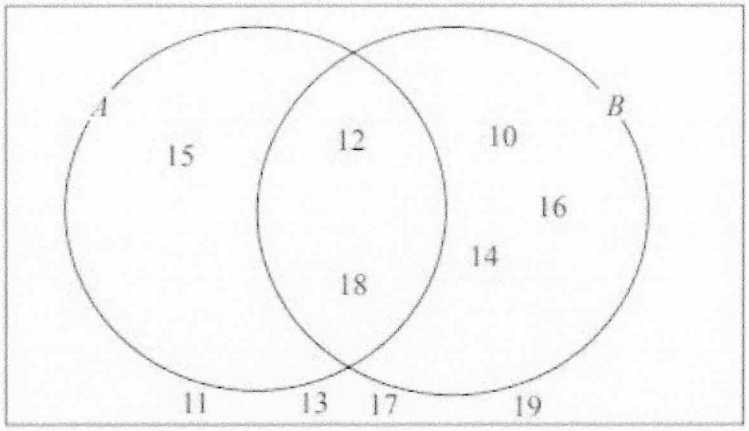
(b) Find the probability that the number is in the set $A \cap B$

$\frac{2}{9}$

(2)

(Total for Question 24 is 5 marks)

26 Here is a Venn diagram.



(a) Write down the numbers that are in set

(i) $A \cup B$

15, 12, 18 10, 14, 16

(ii) $A \cap B$

12, 18

(2)

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

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

$\frac{7}{10}$

(2)

(Total for Question 26 is 4 marks)