

Name

Class



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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.**

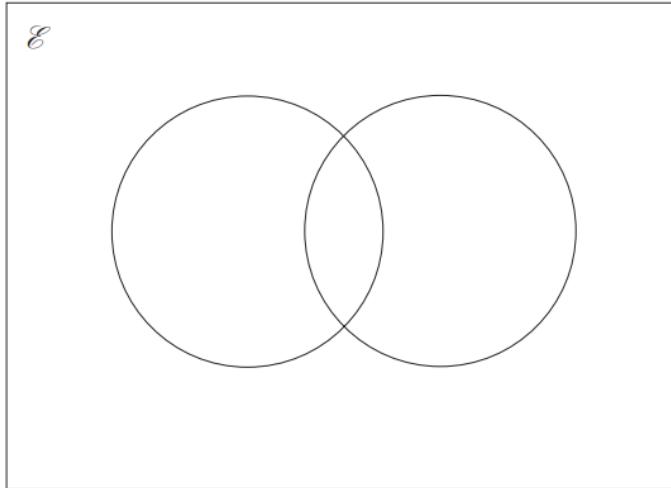
15  $\mathcal{E} = \{\text{odd numbers less than } 30\}$

$$A = \{3, 9, 15, 21, 27\}$$

$$B = \{5, 15, 25\}$$



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



(4)

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

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

(2)

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

$B = \{\text{odd numbers between 14 and 26}\}$

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

.....  
(2)

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

.....  
(1)

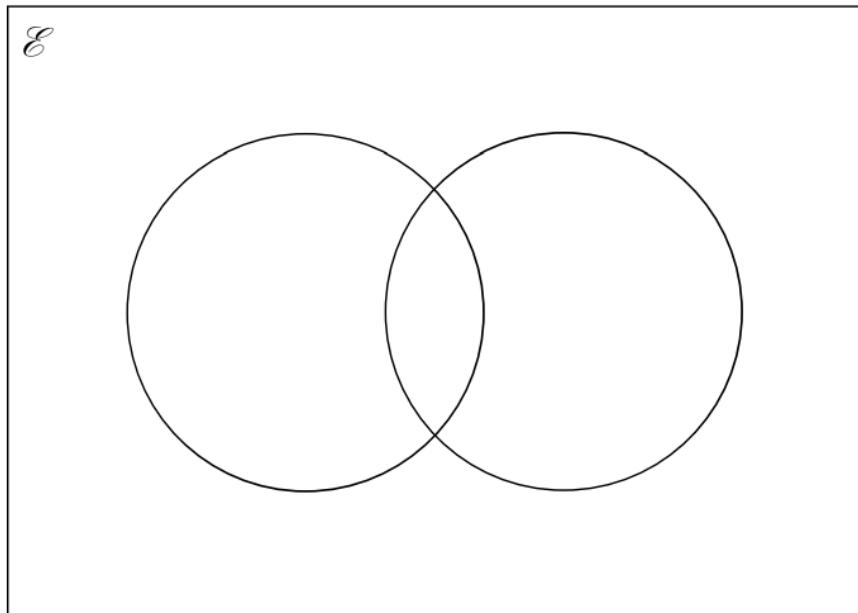
20  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$

$A = \{\text{multiples of 3}\}$

$B = \{\text{even numbers}\}$



Complete the Venn diagram for this information.



20  $\mathcal{E} = \{\text{even numbers between 1 and 25}\}$

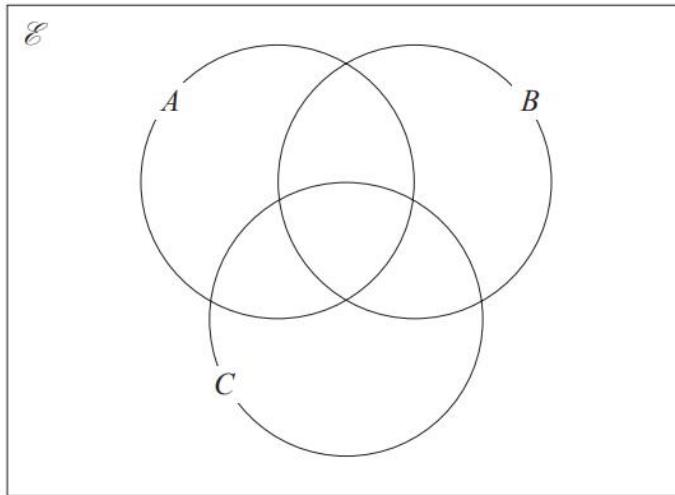
$$A = \{2, 8, 10, 14\}$$

$$B = \{6, 8, 20\}$$

$$C = \{8, 18, 20, 22\}$$



(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)

20  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{multiples of } 2\}$

$A \cap B = \{2, 6\}$

$A \cup B = \{1, 2, 3, 4, 6, 8, 9, 10\}$



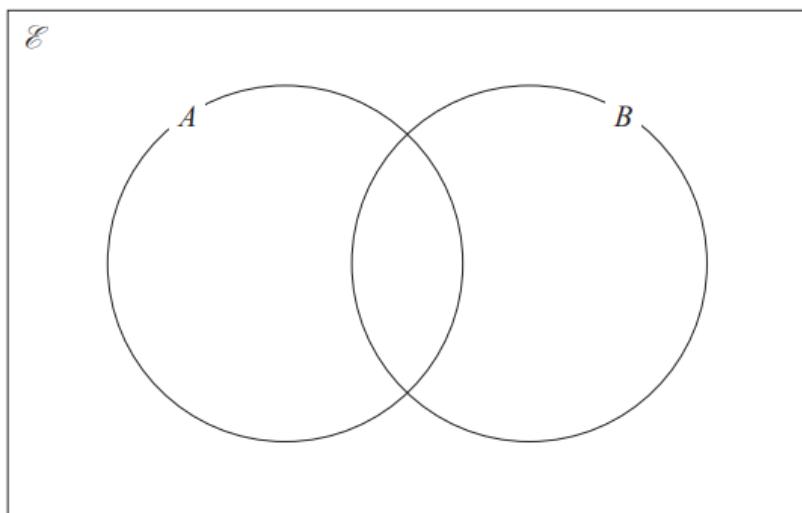
Draw a Venn diagram for this information.

21  $\mathcal{E} = \{\text{even numbers less than } 19\}$

$$A = \{6, 12, 18\}$$

$$B = \{2, 6, 14, 18\}$$

Complete the Venn diagram for this information.



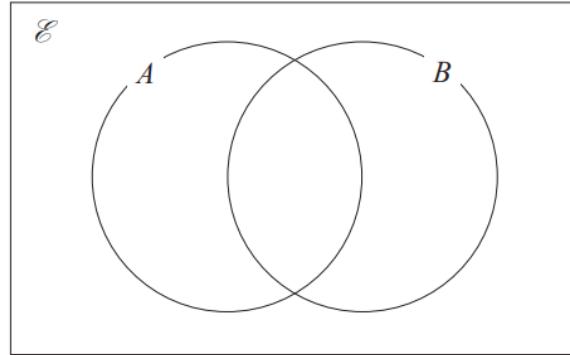
22  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{even numbers}\}$

$B = \{\text{factors of 10}\}$



(a) Complete the Venn diagram for this information.



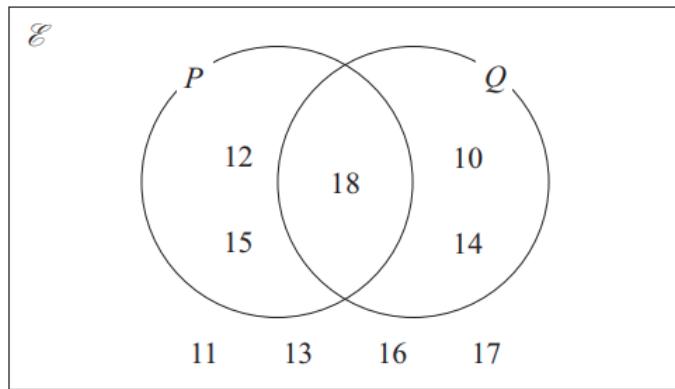
(3)

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

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

(2)

23 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,  $\mathcal{E}$

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

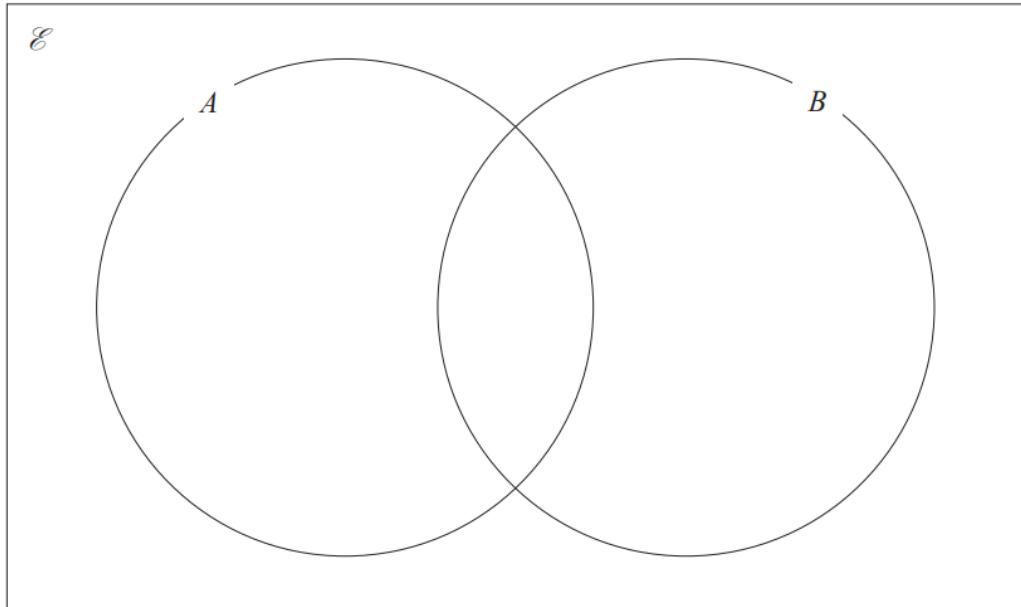
.....  
(2)

24  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{odd numbers}\}$

$B = \{\text{square numbers}\}$

(a) Complete the Venn diagram for this information.



(3)

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

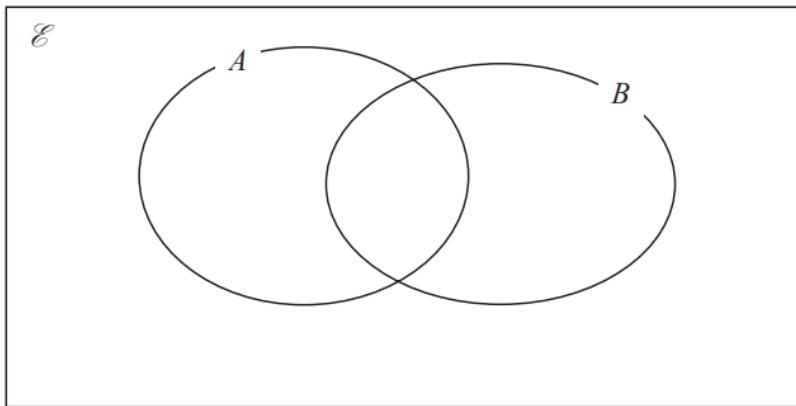
(b) Find the probability that this number is in the set  $B'$

(2)

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

$A = \{1, 5, 6, 8, 9\}$

$B = \{2, 6, 9\}$



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

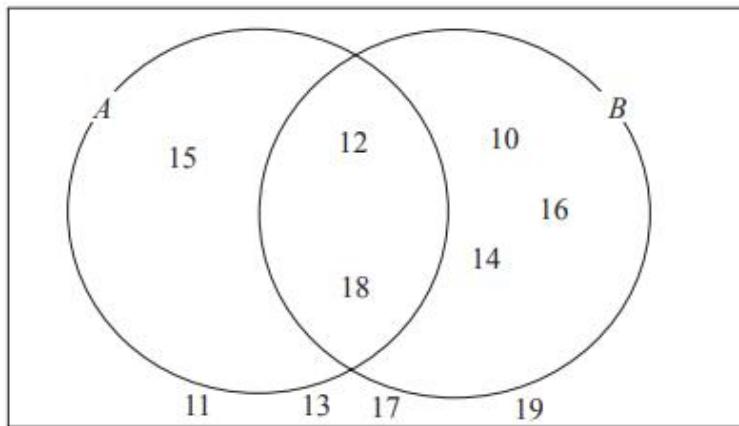
(3)

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

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

.....  
(2)

26 Here is a Venn diagram.



(a) Write down the numbers that are in set

(i)  $A \cup B$

.....  
(2)

(ii)  $A \cap B$

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

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

.....  
(2)