

## Set Notation

Please write clearly in block capitals

Forename:

Surname:

### Materials

For this paper you must have:

- mathematical instruments



You **can** use a calculator.

### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

### Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

### Advice

- In all calculations, show clearly how you work out your answer.

**1** For the following Set notations, circle the correct description.

**1(a)**  $A \cap B$

**[1 mark]**

Belonging to both  $A$  and  $B$

Belonging to  $A$  but not  $B$

Belonging to  $A$  or  $B$  or both

Not belonging to  $A$  or  $B$

**1(b)**  $A' \cup B$

**[1 mark]**

Not a member of  $A$  but a member of  $B$

Not belonging to  $B$  but belonging to  $A$

Not belonging to  $A$  or  $B$

Belonging to  $B$  or not belonging to  $A$

**1(c)** If  $A$  = even numbers more than 0 and  $B$  = prime numbers, what would  $A \cap B$  be?

**[1 mark]**

$\{0, 2\}$

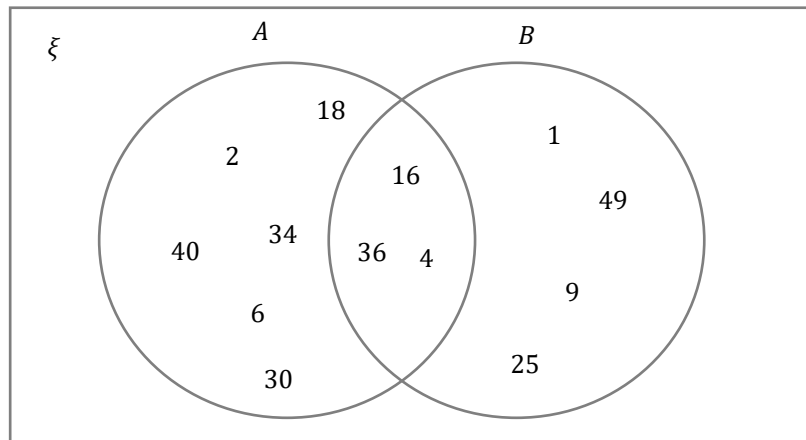
$\{2, -2\}$

$\{2\}$

$\{-2, 0, 2\}$

Turn over for next question

2 Consider the following Venn diagram.



2(a) Which values are described by  $A'$

[1 mark]

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Answer \_\_\_\_\_

2(b) Which values are described by  $A \cap B$

[1 mark]

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Answer \_\_\_\_\_

2(c) Which values are described by  $A \cup B$

[1 mark]

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Answer \_\_\_\_\_

Turn over for next question.

- 3** Students were asked about their subjects taken in Year 10.  
The options in this case were Biology and Textiles.

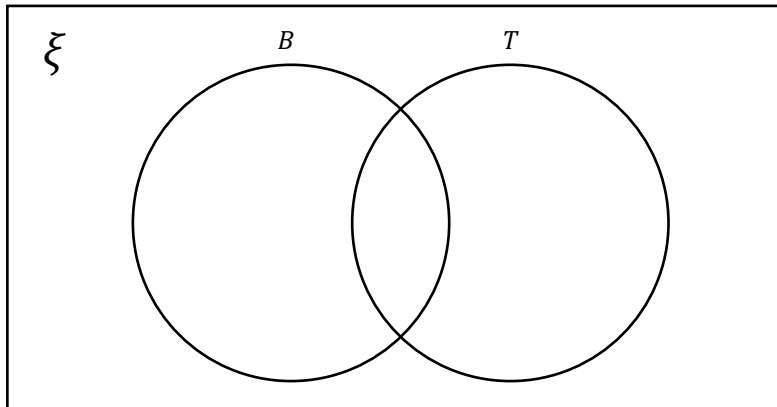
Originally, the probability that a student took Biology was  $\frac{7}{20}$

A new student joins the group and now the probability is  $\frac{1}{3}$

In both cases, 3 students took neither of the two subjects.

- 3(a)** Fill in the Venn diagram with all the information you know.

**[2 marks]**



- 3(b)** Which of the following probabilities would help you fill in the rest of the Venn diagram?  
Circle all that apply.

**[2 marks]**

$P(B)$

$P(B \cap T)$

$P(B \cup T)$

$P(T')$

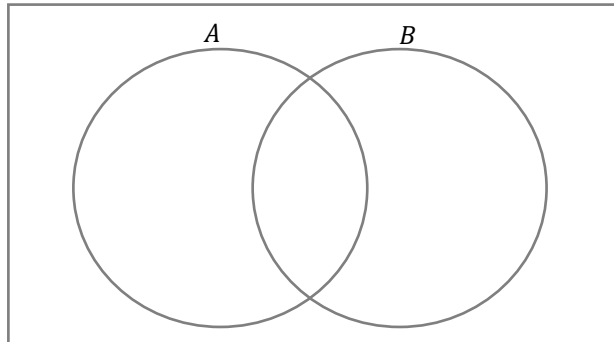
$P(B')$

$P(T \cup B)$

**Turn over for next question**

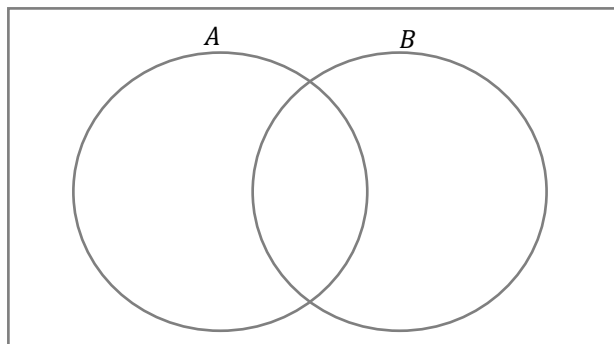
- 4(a)** On the Venn diagram below shade the region represented by  $B'$

[1 mark]



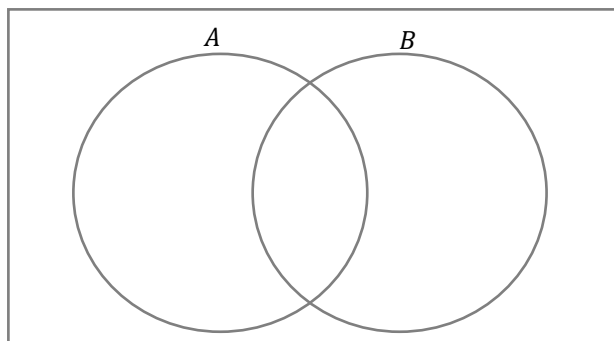
- 4(b)** On the Venn diagram shade to represent  $A \cap B'$

[1 mark]



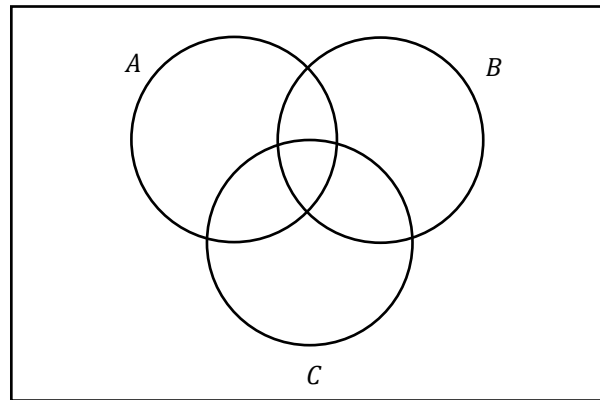
- 4(c)** Shade the Venn diagram to represent  $(A \cup B)'$

[1 mark]



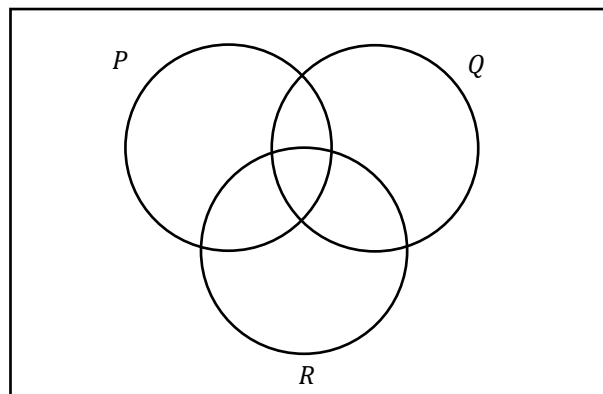
- 5(a)** Label the following Venn diagram with an X in each region to represent  $A \cap (B \cup C)$

[1 mark]



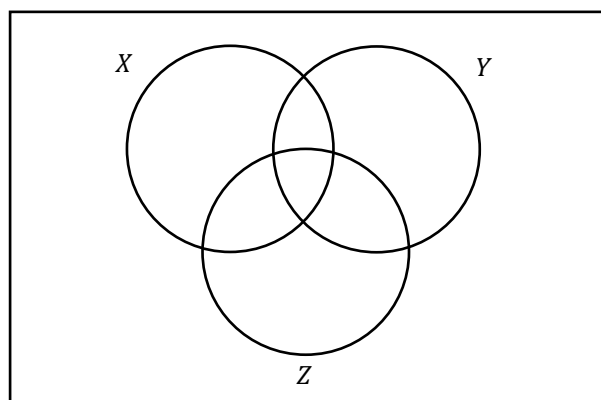
- 5(b)** Label the following Venn diagram with an X in each region to represent  $P' \cup Q \cup R$

[1 mark]



- 5(c)** Label the following Venn diagram with an X in the region that represents  $X \cap Y' \cap Z$

[1 mark]

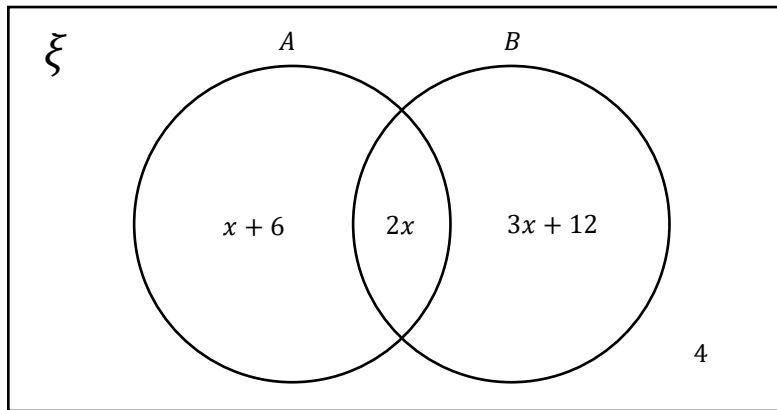


Turn over for next question.

Turn over ►

6 There are two sets displayed in the Venn diagram below.

There are 64 items in the universal set,  $\xi$ .



6(a) Find the value of  $x$ .

[2 marks]

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Answer \_\_\_\_\_

6(b) Find  $P(A)$

[1 mark]

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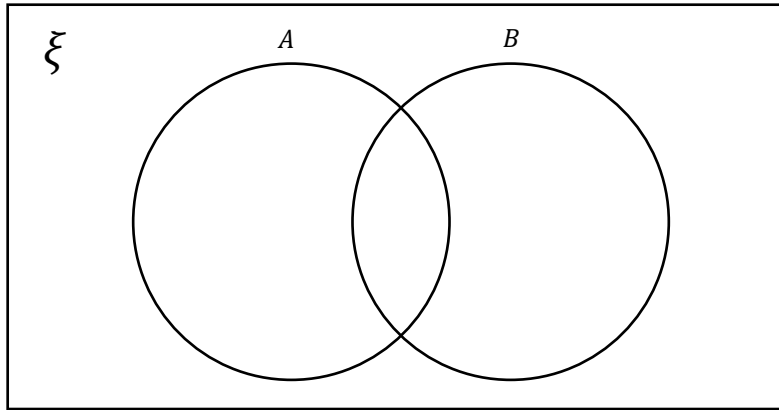
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Answer \_\_\_\_\_

Turn over for next question

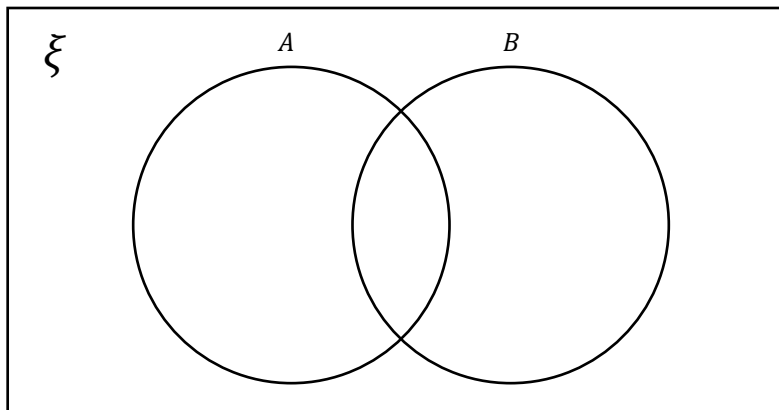
**7(a)** In the diagram below, shade the region that represents  $A \cup B$

[1 mark]



**7(b)** In the diagram below, shade the region that represents  $A \cap B'$

[2 marks]



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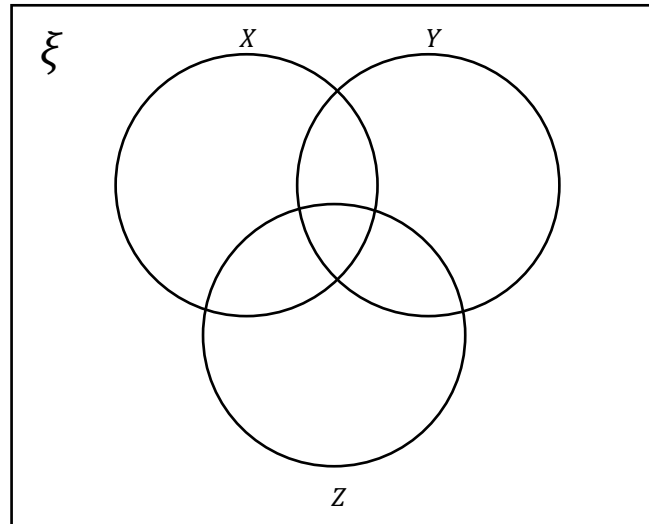


Turn over ►



- 8(a)** On the diagram, mark with the letter *A* the region  $X \cap Y \cap Z$

[1 mark]



- 8(b)** Shade in the region  $Y \cap Z'$  and mark this with the letter *B*

[1 mark]

- 8(c)** Shade in the region  $X \cup Z \cap Y'$  and mark it with the letter *C*

[1 mark]



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