

SETS-SET-1

1

List the elements of the following sets.

(a) $A = \{x | x \in \mathbb{Z}, -4 < x \leq 1\}$

Answer (a) [1]

(b) $B = \{\text{prime numbers between 25 and 35}\}$

Answer (b) [1]

(c) $C = \{x | x \in \mathbb{R}, |x| = 4\}$

Answer (c) [1]

MS-1

(a) -3, -2, -1, 0, 1

B1

(b) 29, 31

B1

(c) -4, 4

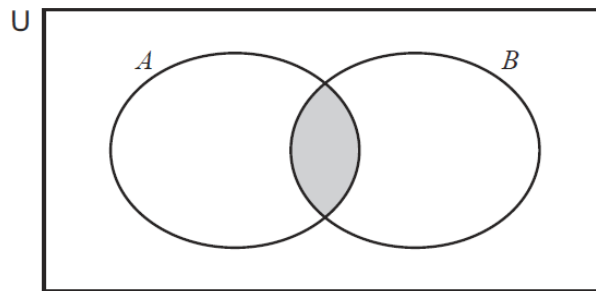
B1

[3]

2

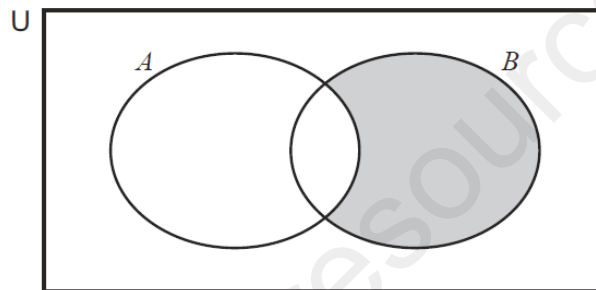
Using set notation describe the regions shaded on the Venn diagrams.

(a)



Answer(a) [1]

(b)



Answer(b) [1]

MS-2

(a)	$A \cap B$	B1	
(b)	$B \cap A'$ or	B1	E.g. $(A \cup B) \cap A'$ $(A \cup B)'$

[2]

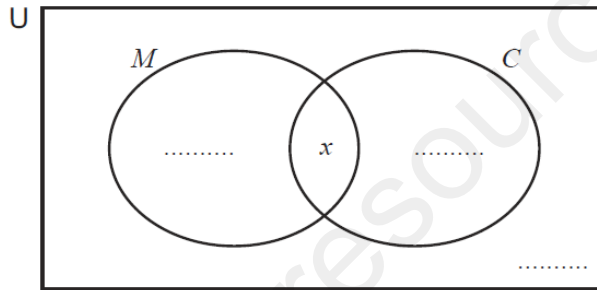
3

All the students in a class of 20 took tests in Mathematics and Chemistry.
The following table shows the results of these two tests.

	Pass	Fail
Mathematics	12	8
Chemistry	11	9

M is the set of students who passed the Mathematics test.
 C is the set of students who passed the Chemistry test.
 x is the number of students who passed both tests.

(a) Write 3 expressions **in terms of x** to complete the Venn diagram.



[3]

(b) Two pupils failed both Mathematics and Chemistry.

Find the value of x , the number of students who passed both tests.

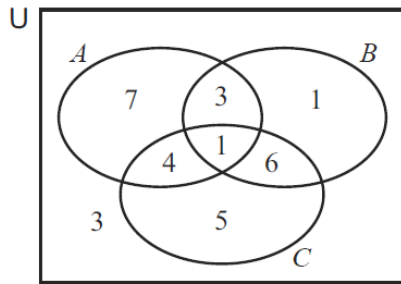
Answer(b) $x = \dots\dots\dots$ [2]

MS-3

(a)	$12 - x, 11 - x, x - 3$ oe	B1B1B1	SC1 for Venn diagram with 7, 6 and 2 seen
(b)	5	B2	If B0 scored give M1 for their $(x - 3) = 2$ or their $(12 - x) + x +$ their $(11 - x) + 2 = 20$ seen.

[5]

4



The Venn diagram shows the **number of elements** in each of the sets A , B and C , and $n(U) = 30$.

(a) Find

(i) $n(A)$,

Answer(a)(i) [1]

(ii) $n(C \cup B')$.

Answer(a)(ii) [1]

(b) Shade the region $(A \cap B) \cup C$ on the Venn diagram. [1]

MS-4

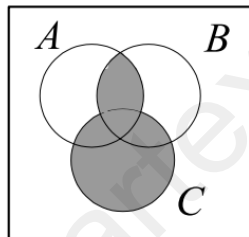
(a) (i) 15

1

(ii) 26

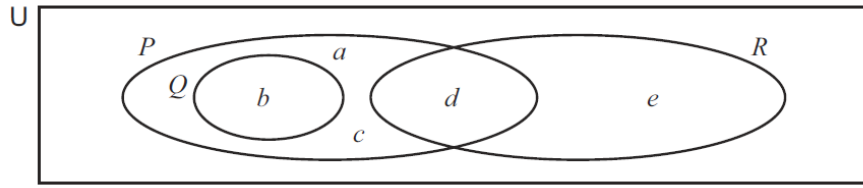
1

(b)



1

5



The Venn diagram shows the sets P , Q and R .

Complete the following statements using set notation.

(a) $P \dots\dots\dots R = \{a, b, c, d, e\}$ [1]

(b) $Q \dots\dots\dots R = \emptyset$ [1]

(c) $e \dots\dots\dots R$ [1]

(d) $P \dots\dots\dots Q = P$ [1]

MS-5

(a)	\cup	1	
(b)	\cap	1	
(c)	\in or $\{e\} \subset$	1	
(d)	\cup	1	

6

The sets P , Q and R are subsets of the universal set U .

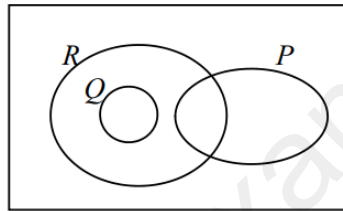
- $P \cap R \neq \emptyset$
- Q is a subset of R
- $Q \cap P = \emptyset$

Complete the Venn diagram to show the sets P , Q , and R .



[3]

MS-6



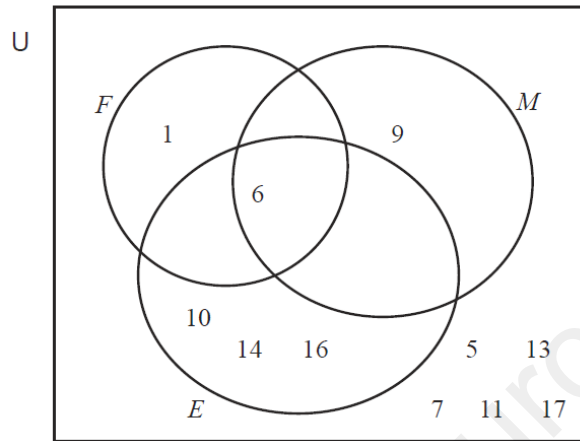
3

B1 for each criterion correct

7

- $U = \{\text{Integers from 1 to 18}\}$
- $F = \{\text{Factors of 12}\}$
- $M = \{\text{Multiples of 3}\}$
- $E = \{\text{Even numbers}\}$

(a) Complete the Venn diagram by putting the numbers 2, 3, 4, 8, 12, 15 and 18 in the correct subsets.



[2]

(b) List the members of

(i) $(E \cup F \cup M)'$,

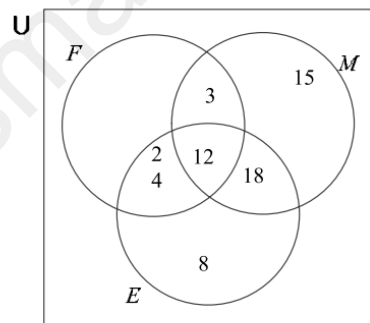
..... [1]

(ii) $E \cap M' \cap F'$.

..... [1]

MS-7

(a)



2

B1 for 1 or 2 numbers omitted or misplaced

(b) (i) 5, 7, 11, 13, 17

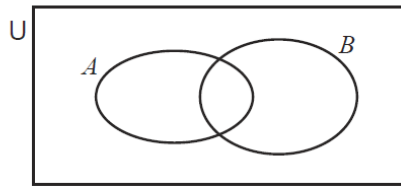
1FT

(ii) 8, 10, 14, 16

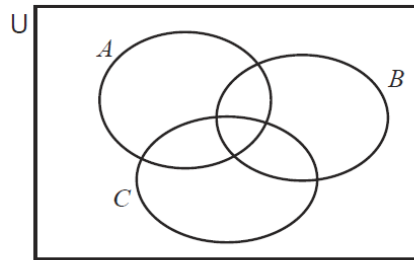
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8

(a) In each diagram, shade the region indicated.



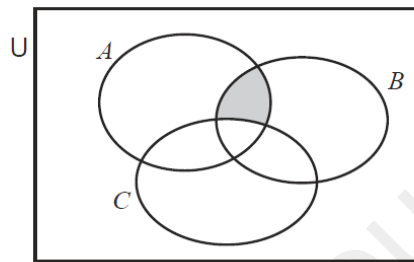
$A \cap B'$



$(A \cup C) \cap B'$

[2]

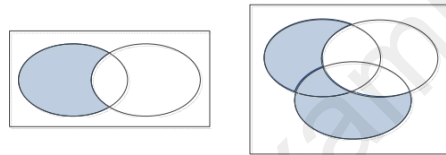
(b) Use set notation to describe the shaded region.



..... [1]

MS-8

(a)



2 B1 for each

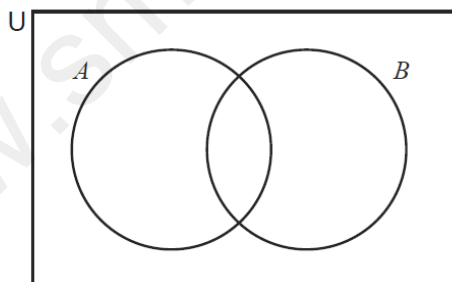
(b)

$A \cap B \cap C'$ or

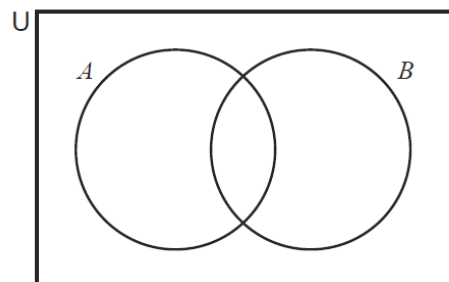
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9

Shade the given sets in each of these diagrams.

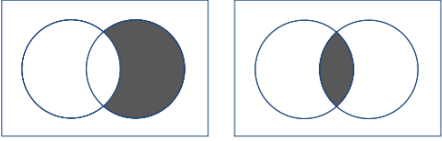

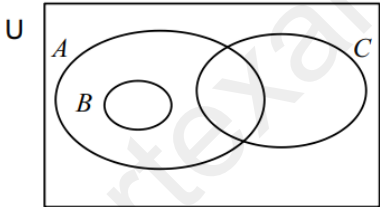


$A' \cap B$

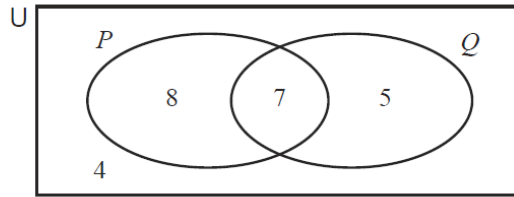


$(A' \cup B)'$

[2]

MS-9		2	B1 for each
10	<p>In the Venn diagram, show the sets A, B and C so that</p> $A \cup B = A, B \cap C = \emptyset \text{ and } A \cap C \neq \emptyset.$ <div style="text-align: center;">  </div>		
[3]			
MS-10		3	B1 for each $A \cup B = A$ $B \cap C = \emptyset$ $A \cap C \neq \emptyset$ satisfied

11



The Venn diagram shows the **number of elements** in each subset.

(a) Find $n(P \cup Q)'$.

Answer(a) [1]

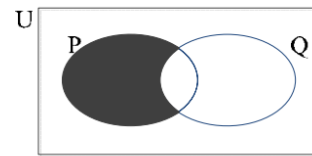
(b) Shade the region $P \cap Q'$. [1]

MS-11

(a)

4

(b)



1

1