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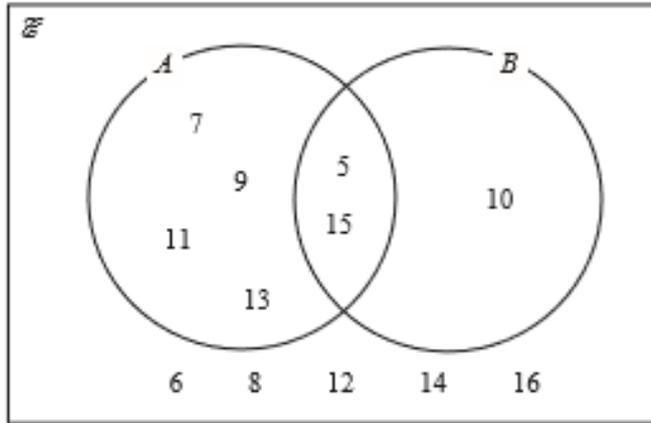
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Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

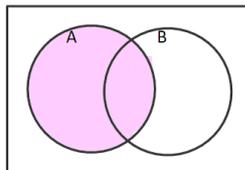
1 Here is a Venn diagram.



List the members of the set

(a)  $A$

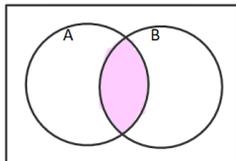
*In A*



7, 9, 11, 13, 5, 15  
(1)

(b)  $A \cap B$

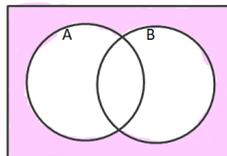
*In A and B*



5 15  
(1)

(c)  $(A \cup B)'$

*not in A or B*



6, 8, 12, 14, 16  
(1)

(Total for Question 1 is 3 marks)



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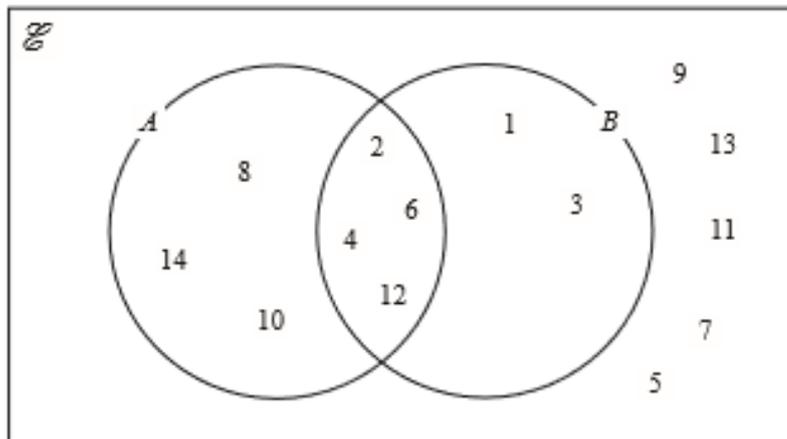
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Answer ALL TWENTY FIVE questions.

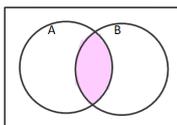
Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The numbers from 1 to 14 are shown in the Venn diagram.



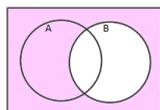
(a) List the members of the set  $A \cap B$  *In A and B*



*2, 4, 6, 12*

(1)

(b) List the members of the set  $B'$  *not in B*



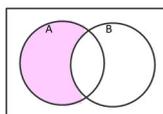
*8, 14, 10, 9, 13, 11, 7, 5*

(1)

A number is picked at random from the numbers in the Venn diagram.

(c) Find the probability that this number is in set A but is not in set B.

*14*



*$\frac{3}{14}$*

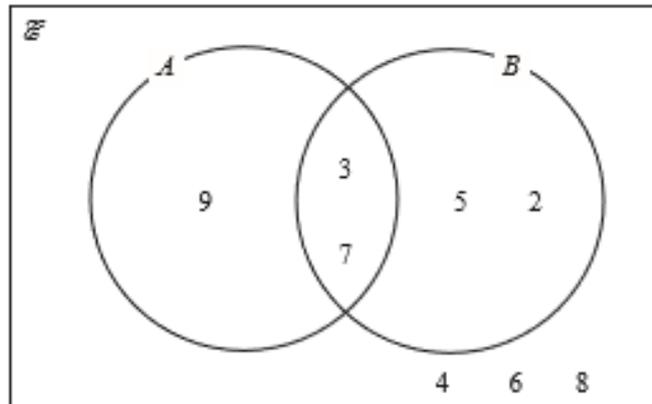
(2)

(Total for Question 1 is 4 marks)

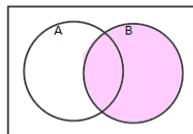


P 6 2 6 5 2 A 0 3 2 6

4 Here is a Venn diagram.

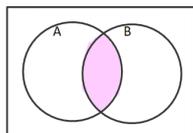


(a) List the members of the set  $B$  *in B*



3 7 5 2 (1)

(b) List the members of the set  $A \cap B$

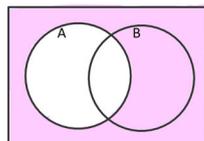


*A and B*

3 7 (1)

(c) List the members of the set  $A'$

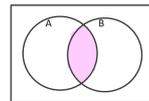
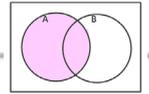
*not in A*



5 2 4 6 8 (1)

(Total for Question 4 is 3 marks)



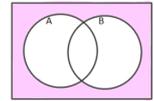
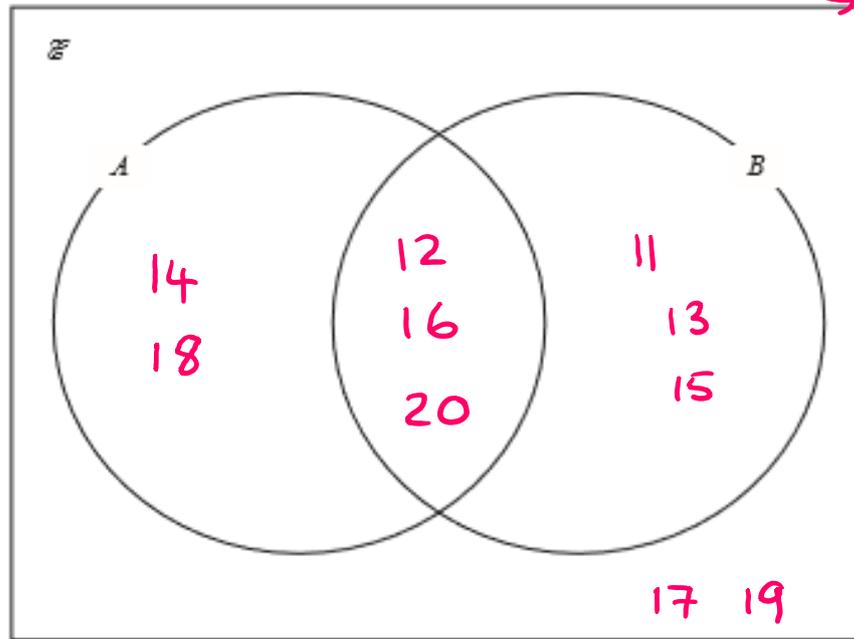


3  $\mathcal{E} = \{11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$

$A = \{\text{even numbers}\}$   
 $A \cap B = \{12, 16, 20\}$   
 $(A \cup B)' = \{17, 19\}$

$A = \ln A$   
 $A \cap B = A \text{ and } B$   
 $(A \cup B)' = \text{not } A \text{ or } B$

Complete the Venn diagram for the sets  $\mathcal{E}, A$  and  $B$



(Total for Question 3 is 3 marks)



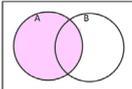
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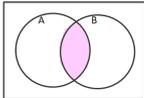
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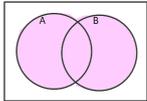
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- 4  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$   
 $A = \{\text{odd numbers}\}$   
 $A \cap B = \{1, 3\}$   
 $A \cup B = \{1, 2, 3, 4, 5, 6, 7, 9, 11, 12\}$

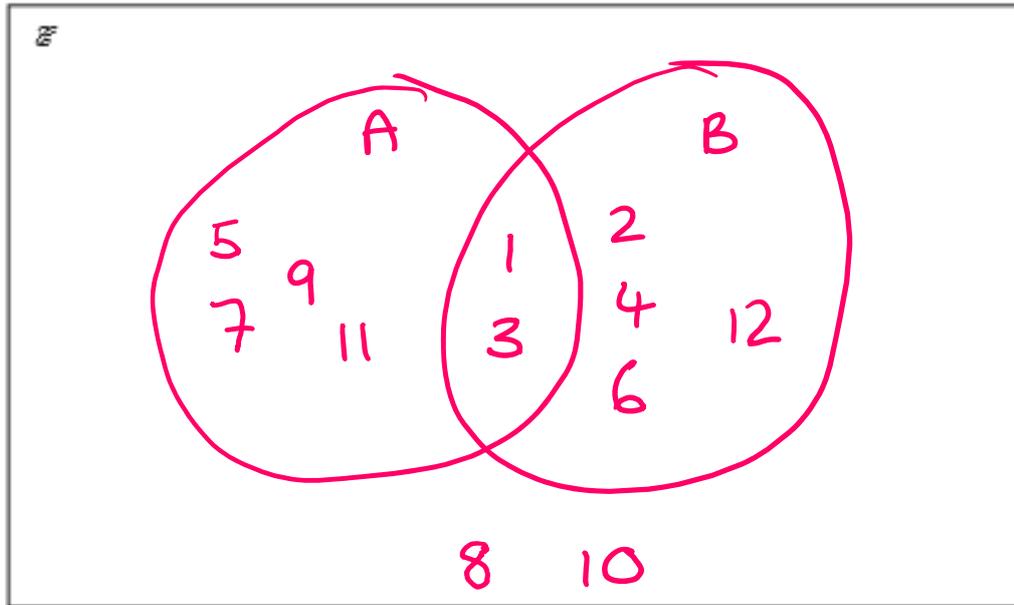
Draw a Venn diagram to show this information.

$A = \text{In } A$  

$A \cap B = A \text{ and } B$  

$A \cup B = A \text{ or } B$  

	1	2	3	4	5	6	7	8	9	10	11	12
A	✓		✓		✓		✓		✓		✓	
B	✓	✓	✓	✓		✓						✓



(Total for Question 4 is 4 marks)



P 5 0 0 1 9 A 0 5 2 4

# January 2022 Paper 1H

7  $\mathcal{E} = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$

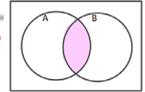
$A \cap B = \{5, 10, 15\}$

$B' = \{7, 8, 9, 11, 12, 13, 14\}$

$A' = \{4, 6, 7, 8, 14\}$

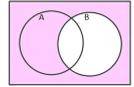
$A \cap B$

A and B



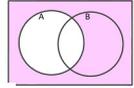
$B'$

Not B



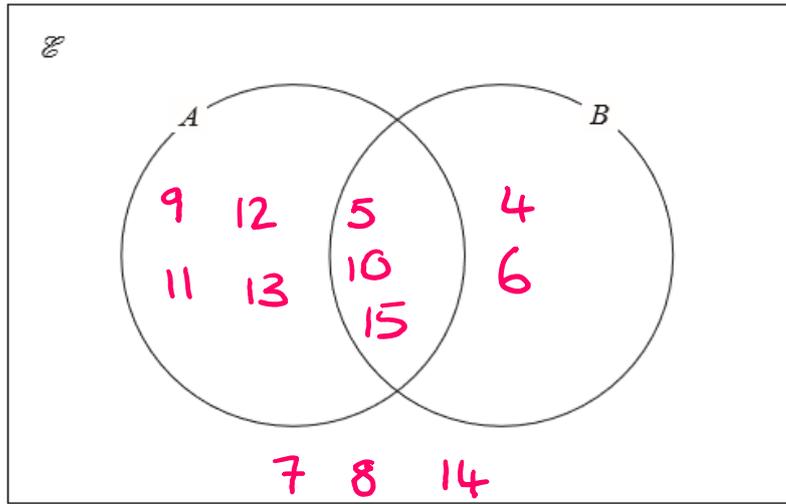
$A'$

Not A



Complete the Venn diagram for this information.

	4	5	6	7	8	9	10	11	12	13	14	15
A	x	✓	x	x	x		✓				x	✓
B		✓		x	x	x	✓	x	x	x	x	✓



(Total for Question 7 is 3 marks)



January 2021 Paper 2HR

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16 Two events  $A$  and  $B$  are such that  $n(A) = 62$   $n(B) = 30$  and  $n(A \cup B) = 68$

Given that  $n(\mathcal{E}) = 80$

(a) complete the Venn diagram to show the number of elements in each region.

$$n(A) + n(B) = 92$$

$$\text{but } n(A \cup B) = 68$$

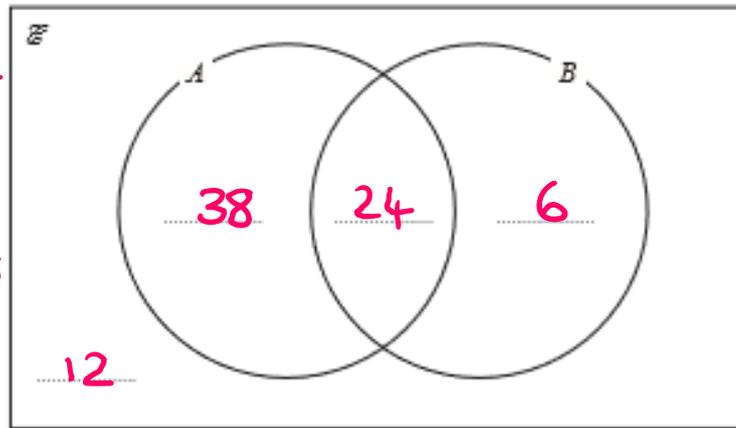
$$80 - 68 = 12$$

$$92 - 68 = 24$$

$$\text{So } A \cap B = 24$$

$$62 - 24 = 38$$

$$30 - 24 = 6$$



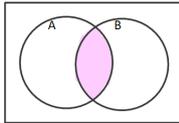
(2)

An element is chosen at random from  $\mathcal{E}$  80

(b) Using the Venn diagram, find the probability that this element is in

(i)  $A \cap B$

$A$  and  $B$

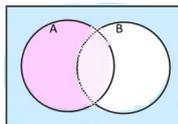


$$\frac{24}{80}$$

(1)

(ii)  $A \cup B'$

$A$  or not  $B$



$$38 + 24 + 12 = 74$$

$$\frac{74}{80}$$

(2)

(Total for Question 16 is 5 marks)



P 6 6 3 0 2 A 0 1 5 2 4