1 Every Chinese New Year holiday, Ji Xiang receives guests from the Fu family, Loo family and Shou family.
The probability of each of the family visiting Ji Xiang on the first day of the holiday is 0.3, 0.7 and 0.2 respectively.

Find the probability that at least one of the families will visit Ji Xiang during the first day of the holiday.

Answer …….. [2]

2 A bag contains 15 red marbles, 3 blue marbles and 2 green marbles. The marbles are identical except for their colour.

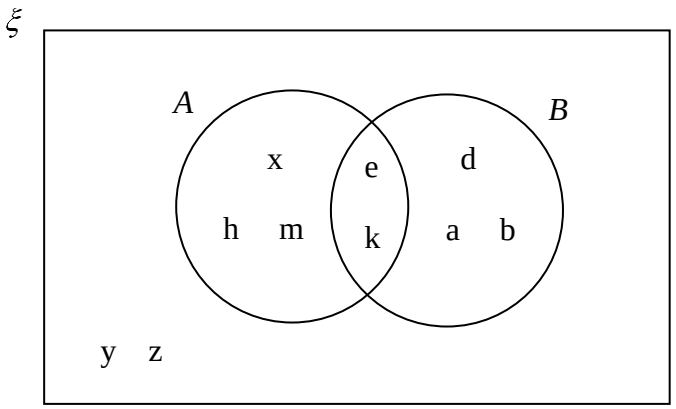
(a) A marble is chosen at random. What is the probability that it is a blue or green marble?

Answer …….. [1]

(b) How many more red marbles must be added to the bag such that the probability of choosing a red marble is $\frac{4}{5}$?

Answer …….. [2]

3 The Venn diagram shows the elements in the sets A and B.



Use one of the symbols below to complete each statement. You may use each symbol more than once.

$$\subset \quad \not\subset \quad \in \quad \notin \quad = \quad \neq$$

(a) $\{\text{h, m}\}$ …… A [1]

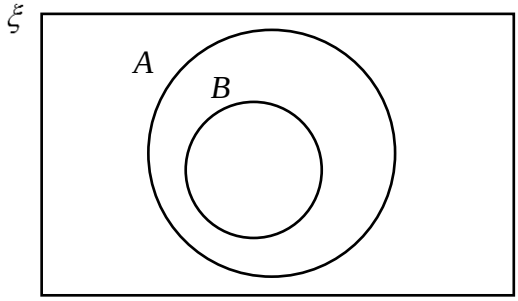
(b) k …… $A \cup B$ [1]

(c) $A' \cap B$ …… $\{\text{a, b, d}\}$ [1]

(d) h …… $(A \cup B)'$ [1]

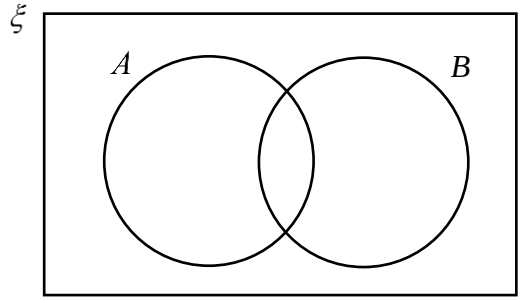
4 **(a)** In each of the Venn diagram given below, shade $(A \cap B)'$.

(i) *Answer*



[1]

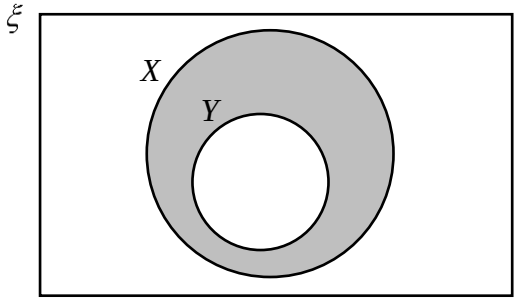
(ii) *Answer*



[1]

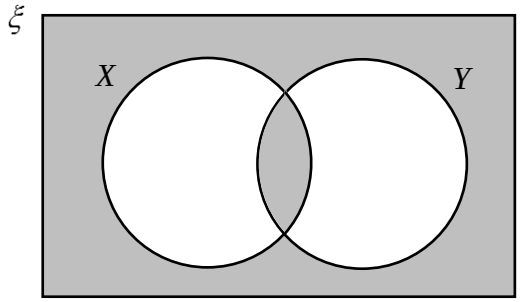
(b) Use set notation to describe the shaded region.

(i)



Answer …….. [1]

(ii)



Answer …….. [1]

5 $\xi = \{x : x \text{ is a whole number less than or equals to } 12\}$

$A = \{x : x \text{ is an even number}\}$

$B = \{x : x \text{ is divisible by } 3\}$

(a) Draw a Venn diagram to illustrate the relationship among the given sets.

Answer

[2]

(b) List the elements of

(i) $A \cap B'$,

Answer …….. [1]

(ii) $A' \cup B'$.

Answer …….. [1]

(c) Describe the set $A \cap B$ in words.

Answer ……..

……...

……...

……... [1]

……...

6 Box *A* contains 3 counters numbered 1, 3 and 9.
Box *B* contains 5 counters numbered 2, 3, 4, 5 and 7.
One counter is removed at random from each box.
The sum and the product of the numbers on the two counters are calculated.

(a) Find the probability that both numbers are square numbers.

Answer …….. [1]

(b) Complete the possibility diagrams below to illustrate the sum and the product of the two numbers drawn. [2]

Box *B*

Box *A*	+	**2**	**3**	**4**	**5**	**7**
	1		4	5		8
	3			7	8	
	9	11	12		14	

Box *B*

Box *A*	×	**2**	**3**	**4**	**5**	**7**
	1	2	3		5	7
	3	6		12		
	9			36		63

(c) Using the possibility diagrams, find the probability, in its simplest form, that the two numbers obtained have

(i) a sum that is odd,

Answer …….. [1]

(ii) a product that is a composite number,

Answer …….. [1]

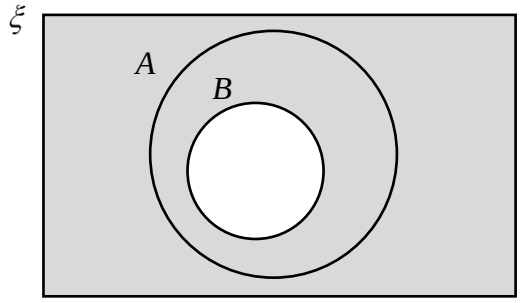
Answer Key

1 0.832

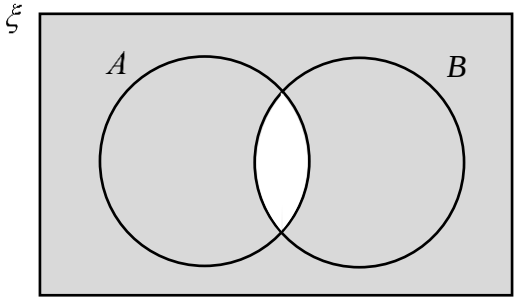
2a 0.25 **2b** 5

3a $\subset$ **3b** $\in$ **3c** = **3d** $\notin$

4ai

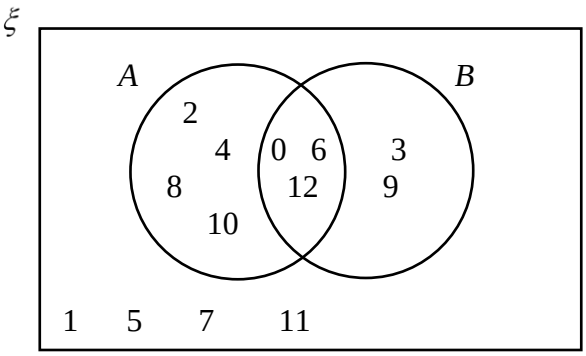


4aii



4bi $Y' \cap X$ 4bii $(X \cup Y) \cap (X \cup Y)'$ or $(X \cup Y) \cup (X' \cap Y')$

5a



5bi {2, 4, 8, 10} **5bii** {1, 2, 3, 4, 5, 7, 8, 9, 10, 11}

5c $A \cap B$ is the set of multiples of 6 / numbers divisible by 6 / numbers that are both even and divisible by 3.

6a $\frac{2}{15}$

6b

Box *A*

+	**2**	**3**	**4**	**5**	**7**
1	**3**	4	5	**6**	8
3	**5**	**6**	7	8	**10**
9	11	12	**13**	14	**16**

Box *A*

×	**2**	**3**	**4**	**5**	**7**
1	2	3	**4**	5	7
3	6	**9**	12	**15**	**21**
9	**18**	**27**	36	**45**	63

6ci $\frac{2}{5}$ **6cii** $\frac{11}{15}$