



Name: _____

Date: _____

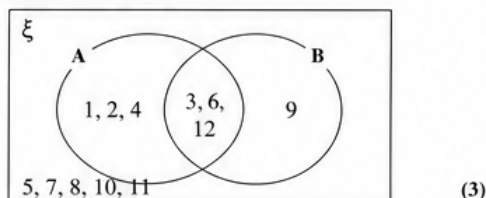
INSTRUCTIONS: Show all your working. Diagrams are NOT accurately drawn unless otherwise indicated.

1. Let $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

A = Factors of 12

B = Multiples of 3

- (a) Complete the Venn diagram.



- (b) Write down $P(A \cap B)$

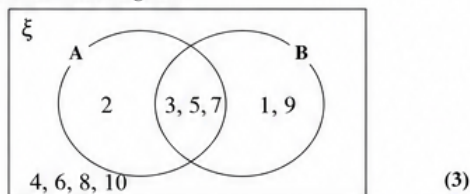
$$\frac{3}{12} = \frac{1}{4} \quad (1)$$

2. Let $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

A = Prime numbers

B = Odd numbers

- (a) Complete the Venn diagram.



- (b) Write down $P(A')$

$$\frac{4}{10} = \frac{2}{5} \quad (1)$$

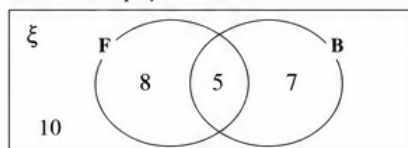
- (c) Write down $P(A \cup B)$

$$\frac{7}{10} \quad (1)$$

3. The Venn diagram shows information about students in a school who play sports.

F = students who play football.

B = students who play basketball.



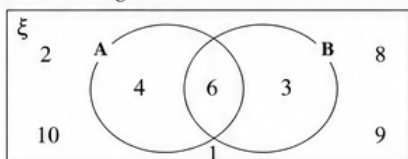
- (a) How many students play football? $\frac{13}{30} \quad (1)$

- (b) How many students are in the survey all together? $\frac{30}{30} \quad (1)$

- (c) How many students play basketball but not football? $\frac{7}{30} \quad (1)$

- (d) Write down the probability that a randomly selected student plays both sports. $\frac{5}{30} = \frac{1}{6} \quad (1)$

4. Here is a Venn diagram.



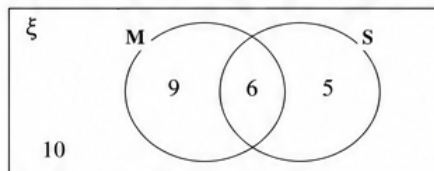
- (a) Write down the numbers in set A . $4, 6 \quad (1)$

- (b) Write down the numbers in set B' . $2, 4, 6, 10, 1, 9 \quad (1)$

- (c) Write down the numbers in $A \cup B$. $4, 6, 3 \quad (1)$

- (d) Write down the numbers in $A \cap B$. $6 \quad (1)$

5. The Venn diagram shows information about students in a school who study maths (M) and science (S).



- (a) Write down $P(M \cap S)$ $\frac{6}{30} = \frac{1}{5} \quad (1)$

- (b) Write down $P(M \cup S)$ $\frac{20}{30} = \frac{2}{3} \quad (1)$

- (c) Write down $P(M')$ $\frac{10}{30} = \frac{1}{3} \quad (1)$

- (d) Write down $P(M \cap S')$ $\frac{9}{30} = \frac{3}{10} \quad (1)$

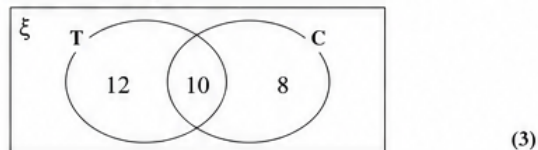
6. A group of 40 people were asked about the drinks they like out of tea (T) or coffee (C).

22 people like tea

18 people like coffee

10 people like both tea and coffee

- (a) Complete the Venn diagram.



- (b) How many people like neither tea nor coffee? $\frac{10}{40} \quad (1)$

- (c) Write down the probability that a randomly selected person likes tea but not coffee. $\frac{12}{40} = \frac{3}{10} \quad (1)$

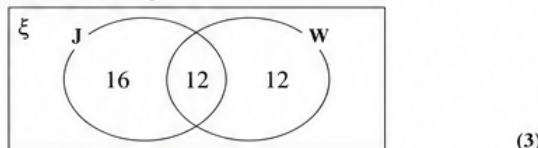
7. A group of 50 people were asked about the drinks they like: juice (J) and water (W).

28 people like juice

24 people like water

12 people like both juice and water

- (a) Complete the Venn diagram.



- (b) How many people like juice only? $\frac{16}{24} \quad (1)$

- (c) A student is selected at random. Given they like water, what is the probability they also like juice? $\frac{12}{24} = \frac{1}{2} \quad (2)$

8. A leisure centre runs two classes: yoga (Y) and pilates (P).

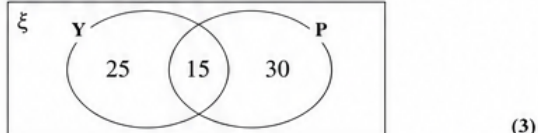
On Sunday, 120 people visited the leisure centre.

40 people attended the yoga class.

15 people attended both yoga and pilates.

50 people did not attend either class.

- (a) Complete the Venn diagram.



- (b) How many people attended the pilates class? $\frac{45}{55} \quad (1)$

- (c) How many people attended only one of the classes? $\frac{55}{55} \quad (1)$



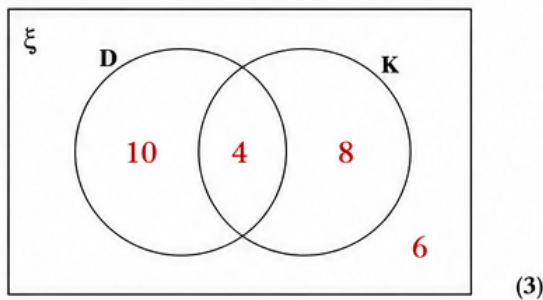
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9. In a class of 30 students:
16 students play the drums (D)
14 students play the keyboard (K)
6 students play neither instrument

(a) Complete the Venn diagram.



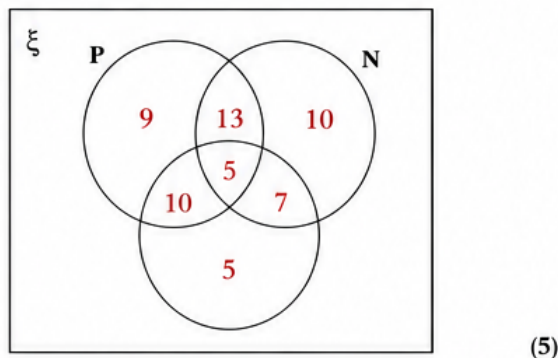
(b) How many students play both instruments? 4 (1)

(c) How many students play only one instrument? 18 (1)

11. At a cinema, 70 people were asked which snacks they like out of popcorn (P), nachos (N) and sweets (S).

35 people like nachos
30 people like sweets
18 people like both popcorn and nachos
15 people like both popcorn and sweets
12 people like both nachos and sweets
5 people like all three snacks
Everyone liked at least one of the snacks

How many people like exactly two snacks?

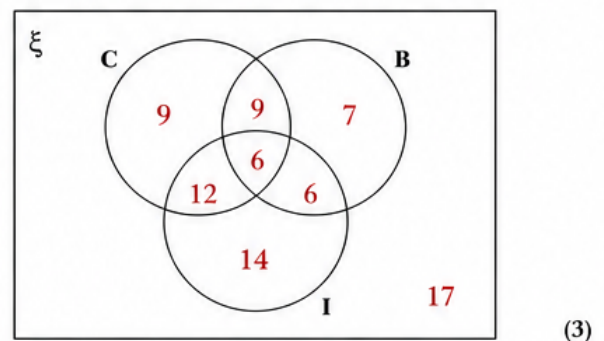


Higher Only

10. At a party, 80 people were asked which desserts they like out of cake (C), brownies (B) and ice cream (I).

42 people like cake
38 people like ice cream
30 people like brownies
18 people like both cake and ice cream
15 people like both cake and brownies
12 people like both ice cream and brownies
6 people like all three desserts

(a) Represent this information on a Venn diagram.

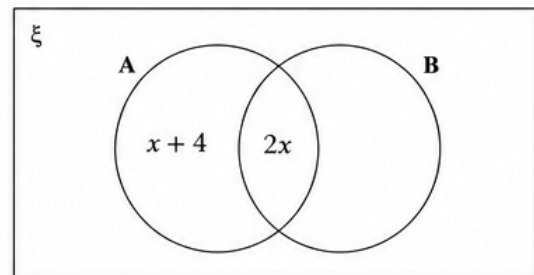


(b) How many people like exactly two desserts? 27 (1)

Higher Only

12. 50 students are asked if they like apples (A) or bananas (B).

The Venn diagram shows some information.



It is known that:

- 30 students like apples.
- 12 students like bananas but not apples.

(a) Find the value of x .

$$30 = (x + 4) + 2x$$

$$3x + 4 = 30$$

$$3x = 26$$

$$x = \frac{26}{3}$$

$$x = \frac{26}{3} \dots\dots\dots (3)$$

(b) How many students like neither apples nor bananas?

$$\text{Bananas not apples} = 12 = (B \text{ only}) = \left(\frac{50}{3}\right)$$

$$\text{Total} = 50$$

$$\text{Neither} = 50 - (30 + 12) = 8$$

$$\dots\dots\dots 8 \dots\dots\dots (2)$$

Higher Only