

CHAPTER 11

Introduction of Set



What will you learn?

- Set
- Venn Diagrams, Universal Sets, Complement of a Set and Subsets

Why study this chapter?

Learn the methods to represent a group of objects with specific characteristics and hence help us to understand the relationship between them. Discuss daily life examples that involve the classification of objects according to specific characteristics.



The Ministry of Urban Wellbeing, Housing and Local Government (UHLG) strives to improve the quality of the people's life by having a clean and healthy environment.



In line with this goal, UHLG always encourages us to practise the 3R programme, which means reduce, reuse and recycle. How can the classification of solid waste be carried out effectively?



Walking through Time



Georg Cantor

Georg Cantor (1845 – 1918) was a German mathematician who first introduced set theory. He published his first article about set theory in the year 1874. Set theory became popular and was recognised as a branch of mathematics in the late 19th century.

For more information:



<https://goo.gl/S4GWib>

Word Link

- Venn diagram • *gambar rajah Venn*
- complement of a set • *pelengkap bagi suatu set*
- description • *perihal*
- set • *set*
- empty set • *set kosong*
- equal sets • *set sama*
- universal set • *set semesta*
- subset • *subset*
- set builder notation • *tatatanda pembina set*
- set notation • *tatatanda set*
- element • *unsur*



Open the folder downloaded from page vii for the audio of Word Link.

11.1 Set

▶ What is set?

In our daily life, we can classify the recyclable materials into several categories, such as paper, plastic, glass, aluminium, fabric and so on. How can these categories of materials be represented mathematically?



LEARNING STANDARDS

Explain the meaning of set.

Exploration Activity 1

Aim: To sort and classify objects.

Instruction: Perform the activity in groups of four.

1. Observe each object given below.



2. Classify the objects according to specific groups.
3. What are the common characteristics of each group?

From the results of Exploration Activity 1, the objects which have common characteristics will be classified into the same group. Each of these groups is known as **set**.

Self Practice 11.1a

1. Classify the objects in the list below as land, water and air transport.

Car

Rocket

Sampan

Lorry

Aeroplane

Boat

Ship

Van

Ferry

Helicopter

Bus

Hot-air balloon

▶ How do you describe sets?

LEARNING STANDARDS

Describe sets using:

- description,
- listing, and
- set builder notation.

Sets can be written by using description, listing and set builder notation.

For example, we can write the colours of *Jalur Gemilang* in set A as follows.



Set A		
Description	Listing	Set builder notation
A is the set of colours of <i>Jalur Gemilang</i> .	<ul style="list-style-type: none">Set A can be represented by using set notation, $\{ \}$.$A = \{\text{red, white, blue, yellow}\}$ <div style="border: 1px solid black; border-radius: 10px; padding: 2px; display: inline-block; margin-top: 5px;">Each element in the set is separated by a comma.</div>Each object in the set is known as an element.	<ul style="list-style-type: none">Set A can also be represented by using set builder notation.$A = \{x : x \text{ is a colour of } \textit{Jalur Gemilang}\}$

Example 1

Describe each of the following sets by using description, listing and set builder notation.

- Letters in the word 'MALAYSIA'
- Odd numbers which are less than 20

Solution

- (a) Let the set be represented by P .

Description: P is the set of letters in the word 'MALAYSIA'.

Listing: $P = \{M, A, L, Y, S, I\}$ ←

The same elements need not be repeated.

Set builder notation: $P = \{x : x \text{ is a letter in the word 'MALAYSIA'}\}$

- (b) Let the set be represented by Q .

Description: Q is the set of odd numbers which are less than 20.

Listing: $Q = \{1, 3, 5, 7, 9, 11, 13, 15, 17, 19\}$

Set builder notation: $Q = \{x : x \text{ is an odd number and } x < 20\}$

Empty set

State the month with 32 days.



There is no month with 32 days!



If M represents the set of month with 32 days, then set M does not contain any element and is known as an **empty set**. An empty set can be represented with the symbol ϕ or $\{ \}$.

Thus, $M = \phi$ or $M = \{ \}$.

Think Smart

How many months have 28 days?

Did You Know?

- An empty set is also called a null set.
- The symbol ϕ is read as phi.

Self Practice 11.1b

- Describe each of the following sets by using (i) description, (ii) listing and (iii) set builder notation.
 - Colours of the rainbow
 - Multiples of 3 which are less than 25
- Determine whether each of the following statements is TRUE or FALSE.
 - If $P = \{\text{triangles which have diagonals}\}$, then $P = \phi$.
 - If $Q = \{\text{prime numbers which are also even numbers}\}$, then $Q = \{ \}$.
 - If $R = \{\text{odd numbers which are divisible by 2}\}$, then $R = \phi$.
 - If $S = \{x : x \text{ is a negative integer and } x^3 < 0\}$, then $S = \{ \}$.

What is the element of a set?

The elements of a set are defined according to certain characteristics. Each of the elements must satisfy the conditions of the set that is defined.

For example, set $A = \{\text{local fruits in Malaysia}\}$.

Durian is a local fruit, so durian is **an element** of set A . Symbol \in is used to represent 'is an element of' the set. Therefore, durian $\in A$.

Apple is not a local fruit, so apple is **not an element** of set A . Symbol \notin is used to represent 'is not an element of' the set.

Therefore, apple $\notin A$.

LEARNING STANDARDS

Identify whether an object is an element of a set and represent the relation using symbol.

Did You Know?

Symbol \in is called epsilon.

Given that $P = \{x : x \text{ is a prime number and } 0 \leq x \leq 20\}$, complete each of the following using the symbol \in or \notin .

- (a) 5 P (b) 8 P
 (c) 19 P (d) 1 P

Solution

$P = \{2, 3, 5, 7, 11, 13, 17, 19\}$ ← List all the elements of P .

- (a) 5 \in P (b) 8 \notin P
 (c) 19 \in P (d) 1 \notin P

Self Practice 11.1c

1. Given that $A = \{\text{states in Malaysia}\}$, complete each of the following using the symbol \in or \notin .

- (a) Johor A (b) Langkawi A
 (c) Putrajaya A (d) Selangor A

2. It is given that $P = \{x : x \text{ is an odd number and } 0 < x < 50\}$ and $Q = \{x : x \text{ is a common multiple of 4 and 6, } x < 100\}$. Complete each of the following using the symbol \in or \notin .

- (a) 8 P (b) 17 P (c) 63 P
 (d) 84 Q (e) 60 Q (f) 46 Q

▶ How do you determine the number of elements of a set?

Number of elements in set P can be represented by the notation $n(P)$.

For example, $P = \{a, b, c, d, e, f\}$, the number of elements in set P is 6. Thus, $n(P) = 6$.



LEARNING STANDARDS

Determine the number of elements of a set and represent the number of elements using symbol.

Example 3

Given that $P = \{\text{letters in the word 'WAWASAN'}\}$ and $Q = \{x : x \text{ is a two-digit number such that the sum of its digits is } 7\}$, find

- (a) $n(P)$ (b) $n(Q)$

Solution

(a) $P = \{W, A, S, N\}$ ← The number of elements is 4.
Thus, $n(P) = 4$

(b) $Q = \{16, 25, 34, 43, 52, 61, 70\}$ ← The number of elements is 7.
Thus, $n(Q) = 7$

Self Practice 11.1d

- Determine the number of elements in each of the following sets.
 - $A = \{\text{cone, cylinder, sphere, pyramid, cube}\}$
 - $B = \{\text{consonants in the word 'KEMAHIRAN'}\}$
 - $C = \{\text{colours of the traffic light}\}$
 - $D = \{\text{multiples of 11 which are less than 100}\}$
- $P = \{\text{integers between } -5 \text{ and } 2\}$ and $Q = \{x : x < 15 \text{ and } x \text{ is an even number}\}$.
Find (a) $n(P)$ (b) $n(Q)$

▶ What is equality of sets?

The sets of alphabets in a word are arranged by three students as follows.

Set $A = \{H, A, R, U, M\}$, set $B = \{M, U, R, A, H\}$ and set $C = \{R, U, M, A, H\}$

Every element in sets A , B and C are the same. So, set A , set B and set C are known as equal sets and can be written as $A = B = C$.

Thus $A = B$, $A = C$ or $B = C$.

Generally, if **every element in two or more sets are the same**, then **all the sets are equal**.

Example 4

Explain whether each of the following pairs of sets are equal sets.

- $P = \{\text{vowels in the word 'SEKOLAH'}\}$ and $Q = \{\text{vowels in the word 'KEJOHANAN'}\}$
- $F = \{\text{perfect squares which are less than } 50\}$ and $G = \{4, 9, 16, 25, 36, 49\}$

Let's Discuss

Can you determine the number of elements in set $A = \{x : x \text{ is a fraction and } 1 < x < 2\}$? Discuss.

SMART TIPS

List all the elements in a set so that the number of elements in the set can be determined.

LEARNING STANDARDS

Compare and explain whether two or more sets are equal and hence, make generalisation about the equality of sets.

SMART TIPS

The order of elements in a set is not important.

Let's Discuss

Discuss:

- If $A = B$, is $n(A) = n(B)$?
- If $n(A) = n(B)$, is $A = B$?

Solution

(a) $P = \{E, O, A\}$ and $Q = \{E, O, A\}$

Each element in set P is equal to each element in set Q .

Thus, $P = Q$

(b) $F = \{1, 4, 9, 16, 25, 36, 49\}$

$G = \{4, 9, 16, 25, 36, 49\}$

$1 \in F$ but $1 \notin G$.

Thus, $F \neq G$

Elements 'A' need not be repeated.

Think Smart

Given $M = \phi$ and $N = \{x : x \text{ is an integer and } 1 < x < 2\}$, is $M = N$?

SMART TIPS

Symbol \neq means 'is not equal to'.

Self Practice 11.1e

- Determine whether each of the following pairs of sets are equal sets.
 - $G = \{\text{letters in the word 'RAJIN'}\}$ and $H = \{\text{letters in the word 'JIRAN'}\}$
 - $M = \{1, 2, 3, 4, 5\}$ and $N = \{\text{whole numbers which are less than } 6\}$
 - $P = \{x : x \text{ is a multiple of } 2 \text{ and } 25 \leq x \leq 45\}$ and $Q = \{x : x \text{ is a number that has the digit } 2 \text{ and } 25 \leq x \leq 45\}$
 - $A = \{\text{national language of Malaysia}\}$ and $B = \{\text{Malay language}\}$

Mastery Q 11.1

Open the folder downloaded from page vii for extra questions of Mastery Q 11.1.

- Describe each of the following sets by using description.
 - $X = \{a, e, i, o, u\}$
 - $Y = \{1, 4, 9, 16, 25, 36, 49\}$
- Write each of the following sets by listing.
 - P is the set of planets in the Solar System.
 - $Q = \{\text{prime factors of } 30\}$
- Write each of the following sets by using set builder notation.
 - $G = \{\text{March, May}\}$
 - $H = \{7, 14, 21, 28, \dots, 98\}$
- Determine whether 4 is the element of each of the following sets.
 - $P = \{1, 2, 3, 4, 5\}$
 - $Q = \{x : x \text{ is a multiple of } 8\}$
 - $R = \{\text{prime numbers}\}$
 - $S = \{x : x \text{ is a factor of } 52\}$
- Sets A , B and C are defined as follows.

$A = \{\text{months that begin with the letter J}\}$
 $B = \{\text{states in Malaysia}\}$
 $C = \{x : x \text{ is a two-digit number such that the sum of its digits is } 5\}$

Find $n(A)$, $n(B)$ and $n(C)$.
- Given that $P = \{7, 3, 13, x, 11, 5\}$ and $Q = \{\text{prime numbers which are less than } 15\}$, if $P = Q$, find the value of x .

11.2 Venn Diagrams, Universal Sets, Complement of a Set and Subsets

What are universal set and complement of a set?



LEARNING STANDARDS

Identify and describe universal sets and complement of a set.

A set that consists of all the elements under discussion is known as the **universal set**.

For example, the set below shows the students who participated in a mathematics quiz.

$\{\text{Amir, Hazura, Laila, Sandra, Zamri, Dali, Pei San, Yana}\}$

In this case, the 8 students are all the students under discussion. Hence, the set can be defined as universal set and is denoted by the symbol ξ .

Thus universal set, $\xi = \{\text{Amir, Hazura, Laila, Sandra, Zamri, Dali, Pei San, Yana}\}$

Among the students, Amir, Hazura, Laila, Sandra and Zamri are members of the Mathematics Society. If set A represents members of the Mathematics Society in the team, then $A = \{\text{Amir, Hazura, Laila, Sandra, Zamri}\}$

The other students in the team; Dali, Pei San and Yana are not members of the Mathematics Society. They are the other students in the universal set and are known as **complement of set A** , written as A' .

$A' = \{\text{Dali, Pei San, Yana}\}$

Example 5

Identify whether each of the following sets is the universal set of $\{2, 3, 5, 7\}$.

- (a) $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
- (b) $\{\text{odd numbers which are less than } 10\}$

Solution

- (a) $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ← Contains all the elements.

Universal set

- (b) $\{1, 3, 5, 7, 9\}$ ← Does not contain element 2.

Not a universal set

Example 6

Given that $\xi = \{x : x \text{ is an integer and } 1 \leq x \leq 10\}$, determine the complement of each of the following sets.

- (a) $P = \{\text{perfect squares which are less than } 10\}$
- (b) $Q = \{\text{factors of } 10\}$

Think Smart

What is the complement of empty set?

Solution

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

- (a) $P = \{1, 4, 9\}$
Thus, $P' = \{2, 3, 5, 6, 7, 8, 10\}$
- (b) $Q = \{1, 2, 5, 10\}$
Thus, $Q' = \{3, 4, 6, 7, 8, 9\}$

Self Practice 11.2a

- Identify whether each of the following is the universal set of $\{1, 3, 5, 7, 9, 11, 13, 15\}$:
 - {whole numbers}
 - {prime numbers}
 - $\{x : x \text{ is a positive integer and } x \leq 15\}$
- Given that $\xi = \{\text{whole numbers which are less than } 10\}$, determine the complement of each of the following sets:
 - $P = \{\text{multiples of } 3\}$
 - $Q = \{\text{prime numbers}\}$

▶ How do you represent the universal set and complement of a set by using Venn diagram?

Besides description and set notation, a set can also be represented by an enclosed geometrical diagram which is known as **Venn diagram**.

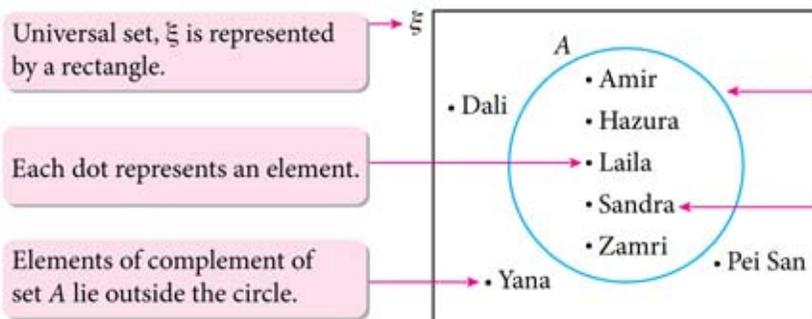
For example,

$$\xi = \{\text{Amir, Hazura, Laila, Sandra, Zamri, Dali, Pei San, Yana}\}$$

$$A = \{\text{Amir, Hazura, Laila, Sandra, Zamri}\}$$

$$A' = \{\text{Dali, Pei San, Yana}\}$$

The relationship between the sets above can be represented by the following Venn diagram.



LEARNING STANDARDS

Represent

- the relation of a set and universal set, and
- complement of a set through Venn diagrams.

SMART TIPS

- A set can be represented by a circle, an oval, a rectangle or a triangle.
- The universal set is commonly represented by a rectangle.

Given that $\xi = \{x : 10 < x < 20, x \text{ is an integer}\}$,
 $M = \{11, 17\}$ and $N = \{\text{odd numbers}\}$.

Draw a Venn diagram to represent

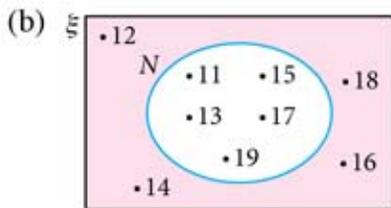
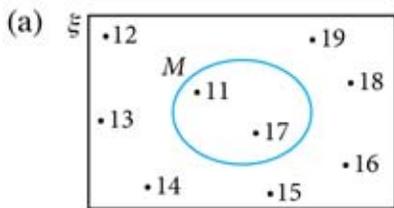
- (a) set ξ and M , (b) N' .

Solution

$$\xi = \{11, 12, 13, 14, 15, 16, 17, 18, 19\}$$

$$M = \{11, 17\}$$

$$N = \{11, 13, 15, 17, 19\}$$



Did You Know?

John Venn (1834–1923), was an English mathematician who used geometrical diagrams to illustrate the relationship between sets. The Venn diagram is named after him.



Self Practice 11.2b

- Represent the relationship between the following sets by using the Venn diagram.
 - $\xi = \{1, 3, 5, 7, 9, 11\}$
 $A = \{3, 5, 9\}$
 - $\xi = \{x : x \text{ is an integer and } 10 < x < 20\}$
 $B = \{\text{prime numbers}\}$
- Represent the complement of each of the following sets by using Venn diagram. Shade the region that represents the complement of the set.
 - $\xi = \{\text{multiples of 3 which are less than 30}\}$
 $P = \{\text{numbers which are divisible by 6}\}$
 - $\xi = \{\text{letters in the word 'PENGELASAN'}\}$
 $Q = \{\text{consonants in the word 'PENGELASAN'}\}$

What are subsets?

Exploration Activity 2



Aim: To identify the subsets of a set.

Instruction: Perform the activity in groups of four.

- Prepare the number cards labelled 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20.
- Use two strings to make two circles on a table which represent the following sets respectively:
 $A = \{\text{multiples of 2}\}$ $B = \{\text{multiples of 4}\}$



LEARNING STANDARDS

Identify and describe the possible subsets of a set.

- Place the number cards in the correct circle.
- What do you notice about the positions of both the circles?
- What is the relationship between set A and set B ?

From the results of Exploration Activity 2, it is found that every element in set B is also an element of set A . Set B is known as a **subset** of set A and is written as $B \subset A$.

Example 8

For each of the following, determine whether set A is a subset of set B .

- $A = \{2, 4, 6\}$ and $B = \{1, 2, 3, 4, 5, 6\}$
- $A = \{\text{prime numbers which are less than } 20\}$ and $B = \{\text{odd numbers which are less than } 20\}$
- $A = \{\text{letters in the word 'SOPAN'}\}$ and $B = \{\text{letters in the word 'KESOPANAN'}\}$

Solution

(a) $A \subset B$ ← Every element of A is found in B .

(b) $A = \{2, 3, 5, 7, 11, 13, 17, 19\}$
 $B = \{1, 3, 5, 7, 9, 11, 13, 15, 17, 19\}$ ← Element 2 is not in B .
 $A \not\subset B$

(c) $A \subset B$ ← Every element of A is found in B .

On the first day of athletics championships, three track events will be held and they include 100 m, 200 m and 400 m. Each student can participate in one, two or all the three events.

If set A represents the track events held on the first day of athletics championships, then $A = \{100 \text{ m}, 200 \text{ m}, 400 \text{ m}\}$.

The events that a student may participate in are $\{100 \text{ m}\}$, $\{200 \text{ m}\}$, $\{400 \text{ m}\}$, $\{100 \text{ m}, 200 \text{ m}\}$, $\{100 \text{ m}, 400 \text{ m}\}$, $\{200 \text{ m}, 400 \text{ m}\}$, $\{100 \text{ m}, 200 \text{ m}, 400 \text{ m}\}$. The student may also not participate in any event and it is represented by the empty set, $\{\}$.

Thus, each set of the listed events is a subset of set A .

Let's Discuss

Referring to Exploration Activity 2, if set C represents multiples of 8, discuss the relationship between set C and set B , and the relationship between set C and set A .

Think Smart

What is the relationship between P and Q if $P \subset Q$ and $Q \subset P$?

SMART TIPS

'Is not a subset of' can be denoted using the symbol $\not\subset$. For example, ' P is not a subset of Q ' can be written as $P \not\subset Q$.

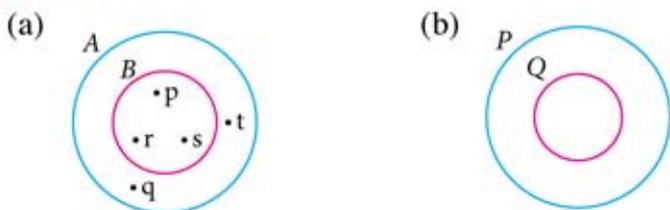
SMART TIPS

- Empty set, ϕ is a subset of any set.
- Set itself is a subset of any set.

Example 10

Represent the relationship of each of the following pairs of sets, using Venn diagrams.

- (a) $A = \{p, q, r, s, t\}$ and $B = \{p, r, s\}$
 (b) $P = \{\text{whole numbers}\}$ and $Q = \{\text{prime numbers}\}$

Solution

For an infinite set, its elements need not be written.

**Self Practice 11.2d**

1. Represent the relationship of each of the following pairs of sets, using Venn diagrams.
- (a) $A = \{10, 20, 30, 40, 50, 60, 70\}$ and $B = \{20, 40, 60\}$
 (b) $M = \{\text{letters in the word 'BIJAK'}\}$ and
 $N = \{\text{vowels in the word 'BIJAK'}\}$

▶ How do you represent the relationships between sets using Venn diagrams?

The relationships between sets, subsets, universal sets and complement of a set can be illustrated clearly by using Venn diagrams.

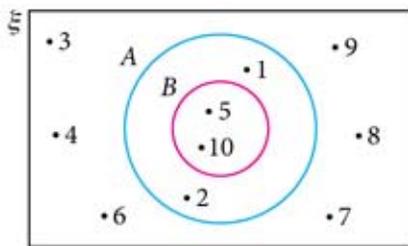
Example 11

Represent the relationship between the following sets, using a Venn diagram.

- $\xi = \{x : x \leq 10, x \text{ is a positive integer}\}$
 $A = \{\text{factors of } 10\}$
 $B = \{\text{numbers which are divisible by } 5\}$

Solution

- $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
 $A = \{1, 2, 5, 10\}$
 $B = \{5, 10\}$



LEARNING STANDARDS

Represent the relations between sets, subsets, universal sets and complement of a set using Venn diagrams.

1. Represent the relationship between the following sets, using a Venn diagram.

$$\xi = \{a, b, c, d, e, f, g, h\}$$

$$P = \{a, b, c, d\}$$

$$Q = \{b\}$$

$$R = \{f, g\}$$

Mastery Q 11.2



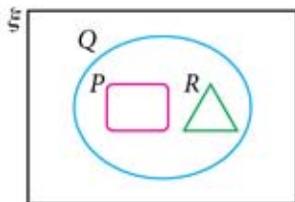
Open the folder downloaded from page vii for extra questions of Mastery Q 11.2.

1. Given that $\xi = \{\text{whole numbers which are less than } 10\}$, $A = \{\text{factors of } 18\}$ and $B = \{0, 4, 5, 7, 8\}$. With the help of a Venn diagram, determine whether $A' = B$.

2. Based on the Venn diagram, state the relationship between

(a) P and Q ,

(b) Q and R .



3. Given that $K = \{\text{perfect squares which are less than } 20\}$,

(a) write all the possible subsets of K .

(b) if $L = \{1, 2, 3, \dots, 20\}$, draw a Venn diagram to represent the relationship between K and L .

4. In a class, some of the girls wear spectacles while all of the boys do not wear spectacles. Sets ξ , P , Q and R are defined as follows:

$$\xi = \{\text{students in the class}\}$$

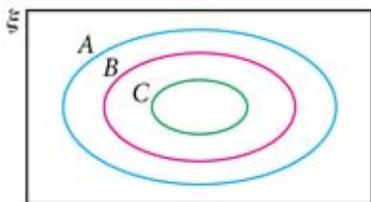
$$P = \{\text{girls}\}$$

$$Q = \{\text{boys}\}$$

$$R = \{\text{students who wear spectacles}\}$$

Represent the relationship between sets ξ , P , Q and R , using a Venn diagram.

5.



Based on the Venn diagram, write the relationship between sets ξ , A , B and C .

SUMMARY

SETS

Empty set

\emptyset or $\{ \}$

Equal sets

Example:

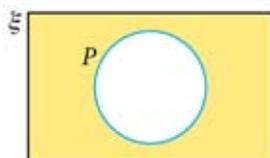
$A = \{M, A, S, A\}$

$B = \{S, A, M, A\}$

Set $A =$ Set B

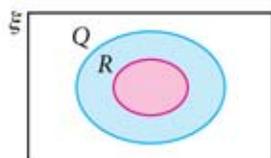
Universal set, ξ

Complement of a set



- Shaded region is P' .
- Complement of P is P' .

Subset



$R \subset Q$

At the end of this chapter, I can...



explain the meaning of set.

describe sets using description, listing and set builder notation.

identify whether an object is an element of a set and represent the relation using symbol.

determine the number of elements of a set and represent the number of elements using symbol.

compare and explain whether two or more sets are equal, hence, make generalisation about the equality of sets.

identify and describe universal sets and complement of a set.

represent the relation of a set and universal set, and complement of a set using Venn diagrams.

identify and describe the possible subsets of a set.

represent subsets using Venn diagrams.

represent the relations between sets, subsets, universal sets and complement of a set using Venn diagrams.

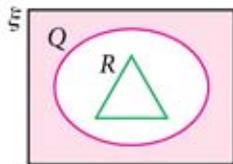


Test Yourself

- Describe set $P = \{\text{square, rectangle, trapezium, parallelogram, kite, rhombus}\}$ by using description.
- $A = \{x : x \text{ is neither a positive integer nor a negative integer}\}$.
What is the element of A ?
- Explain whether each of the following pairs of sets are equal sets.
 - $P = \{\text{even numbers}\}$; $Q = \{\text{multiples of 2}\}$
 - $A = \{0\}$; $B = \phi$
 - $E = \{\text{factors of 15}\}$; $F = \{\text{numbers which are divisible by 15}\}$

Self Mastery

- If $\xi = \{x : 10 \leq x \leq 30, x \text{ is an even number}\}$ and $P = \{\text{multiples of 4}\}$, find $n(P')$.
- Given that universal set ξ , $A \subset B$ and $C \subset A$, draw a Venn diagram to represent sets ξ , A , B and C .
- Based on the Venn diagram,
 - what is the relationship between Q and R ?
 - what is represented by the shaded region?



Challenge Yourself

- Set $P = \{\text{positive integers}\}$ and set $Q = \{\text{prime numbers that are greater than 2}\}$.
 - Which set is the universal set? Justify your answer.
 - If $Q \subset R \subset P$, define set R by description.
- A training centre offers three courses such as cooking, design and computer. If set K represents the courses offered by the training centre and each possible choice a student makes is a subset of K , determine the number of possible choices a student can make.
- The following is a conversation between Yazid and Mei Li.
 Yazid : If the universal set is $\{\text{students in Class 1 Bakti}\}$ and set $A = \{\text{female prefects}\}$, what is the complement of set A ?
 Mei Li : Complement of set A is the girls who are not prefects.
 Is the statement made by Mei Li true or not true?
 Justify your answer.

ASSIGNMENT

The campaign of separating household solid waste is one of the steps to reduce the amount of waste generated and delivered to landfills. By practising the classification of solid waste, we can reduce pollution and hence conserve the natural resources.

The classification of household solid waste involves the classification of solid waste according to waste composition such as paper, plastic and other recyclable materials and residues. By using the concept of set and Venn diagram, write a report regarding the classification of household solid waste.



Scan the QR Code or visit <http://goo.gl/2rMjGC> to obtain the information regarding classification of household solid waste.

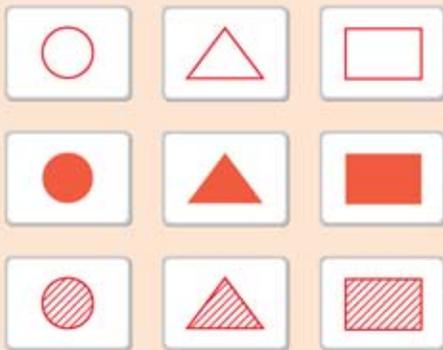


Exploring MATHEMATICS

Game

Method to prepare the materials

1. Prepare nine cards whereby each card is drawn with a circle, a triangle and a rectangle respectively. Each shape has three types of patterns such as empty, coloured and striped as shown in the illustration.



2. By using the same method, prepare nine similar cards for three different colours such as blue, green and yellow. Thus, the total number of cards obtained is 36.

Method to play

1. A game for four players.
2. Shuffle all the cards and distribute equally to all the players.
3. The cards for each player should be covered and cannot be seen by other players.
4. Each player picks a card at random from the player on his right.
5. The players need to collect four cards with the same shape or same pattern or same colour as one set.
6. The player who succeeds in collecting the most sets is the winner.