

Mathematics

Topic 8: Sets

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1. Choose the correct words from the list to fill the gaps in the text about **members and elements**.

symbols	equal	equivalent	members	elements
collection	relationship	element	subset	empty

A set is a ^{a)} _____ of things. The things in a set are called its

^{b)} _____ or the ^{c)} _____ of the set. Common examples of sets:

- a set of chairs in a classroom
- a set of spoons
- a set of glasses
- the set of even numbers
- a set of plates used in a restaurant

In dealing with sets, we use certain symbols to indicate the ^{d)} _____ between sets.

Look carefully at the table below and refer to the ^{e)} _____ whenever you need to.

$y \in Z$: element y is a member of set Z	$x \notin C$: is not an ^{f)} _____ of set C
$D = E$: set D is ^{g)} _____ to set E	$F \neq G$: set F is not equal to set G
$A \sim B$: sets A and B are ^{h)} _____.	$R \not\sim S$: sets R and S are unequivalent
$S \subset H$: S is a ⁱ⁾ _____ of H	$W \not\subset R$: W is not a subset of R
$\{ \}$ or \emptyset : ^{j)} _____ set	

2. Underline the correct word to make sentences about **Venn diagrams**.

^{a)} equal / certain / group sets are sets with the same number of members, which are the same

^{b)} signs / subsets / elements.

^{c)} relation / equivalent / shared sets have the same number of objects or members.

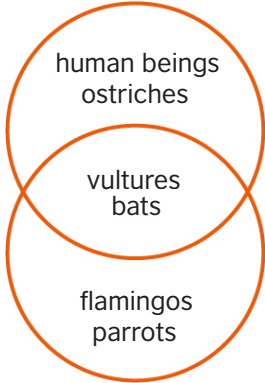
^{d)} unequivalent / common / group sets do not have the same number of objects.

When a set has nothing in it, we say it is an ^{e)} form / empty / fall set or a null set.

When the statement in the set holders is untrue, the set is also empty.

When a set contains elements of another set, it is called a ^{f)} place / nothing / subset of the set.

3. Read the sentences on using **Venn diagrams** to represent sets and choose the correct word.

<p>Example:</p> <p>Set $P = \{\text{human beings, vultures, ostriches, bats}\}$</p> <p>Set $Q = \{\text{vultures, flamingos, parrots, bats}\}$</p> <p>Sets P and Q are both sets of living creatures with two legs.</p> <p>Set Q contains animals with two legs that can fly.</p>	
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The intersection of the ovals (the parts that overlap) contain the ^{a)} **common / uncommon** elements.

The sections of the ovals that do not overlap or intersect are known as the ^{b)} **common / uncommon** elements. This is how common elements and uncommon elements are represented on the Venn diagram.

We write $P \cap Q = \text{vultures, bats}$ where \cap represents ^{c)} **common / uncommon** elements.

We write $P \cup Q = \text{human beings, flamingos, ostriches, parrots}$, where \cup represents ^{d)} **common / uncommon** elements.

When the elements in a Venn diagram are placed in a diagram representing the union of the sets, the ^{e)} **common / uncommon** members or elements are only recorded once.

We write $P \cup Q = \text{vultures, bats, human beings, flamingos, ostriches, parrots}$.

4. Unscramble the letters to make words that fill the gaps in the text about **identifying sets**.

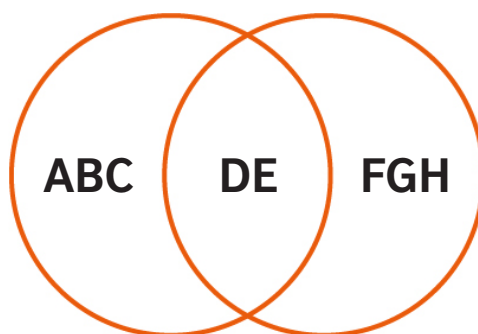
A set is a ^{a)} **grogupin** _____ of items or elements. The pupils in your class, for example, ^{b)} **morf** _____ a set. The numbers from 1 to 10 can also

^{c)} **morf** _____ a set, or letters of the alphabet, or ^{d)} **mites** _____ on a shelf at the supermarket. These are just some examples of sets, evident in everyday practice.

If elements of sets are ^{e)} **rashed** _____, these fall in the

^{f)} **sinetrection** _____ of the sets. In the example below, D and E are

^{g)} **momonc** _____ to both sets and form the ^{h)} **sinetrection** _____ set.



The **union** set $(A \cup B)$ contains all the elements of all the sets. In this example, this set = {A, B, C, D, E, F, G, H}.

5. Find the words about **shared items** in the word search.

C	S	A	H	E	E	U	I	I	F	P	T	I	I	A	E
E	X	O	A	M	E	V	I	D	E	N	T	T	E	I	S
B	S	M	G	L	Y	N	R	P	E	S	T	A	C	S	K
G	E	E	Q	U	I	V	A	L	E	N	T	B	H	I	Z
T	O	D	F	A	V	L	A	C	Y	I	S	W	R	S	D
P	E	S	T	E	R	V	U	T	A	F	M	E	O	R	R
T	J	N	I	E	I	D	S	G	I	B	G	D	E	S	O
H	O	O	V	U	E	Z	E	N	Y	X	E	K	I	R	E
C	R	O	Q	E	E	C	X	D	L	T	Y	A	S	C	M
N	B	E	S	N	I	E	E	A	N	L	P	T	Y	S	I
S	N	O	L	W	G	R	O	U	P	E	P	A	M	L	R
U	U	H	T	A	A	T	G	I	K	M	E	V	B	C	T
O	X	B	F	H	T	A	T	H	U	S	R	A	O	I	J
K	X	V	S	W	V	I	E	J	U	O	V	A	L	A	Z
P	C	X	R	E	F	N	O	I	S	P	J	O	E	I	H
O	B	J	E	C	T	S	U	N	C	O	M	M	O	N	G

both
certain
contain
equivalent
evident
group
object
oval
overlap
relation
shared
subset
symbol
uncommon
unequivalent

6. Make compound phrases on **presenting sets** and match them to their definitions.

Compound phrases			Definitions	
a)	union	diagram members set	1	A group which is made up of members shared by two or more groups.
b)	Venn		2	A drawing of circles that cross over each other, showing features shared by different sets.
c)	intersection		3	The overlapping of two sets containing all elements of A that also belong to B.
d)	common		4	A group of elements that are shared by more than one group.
r)	non-common		5	The elements that are not shared and only belong to one group.
f)	null		6	The solution set for an equation that has no solution.

Underline correct phrase		Write the correct definition below
a)	diagram / members / set	
b)	diagram / members / set	
c)	diagram / members / set	
d)	diagram / members / set	
e)	diagram / members / set	
f)	diagram / members / set	

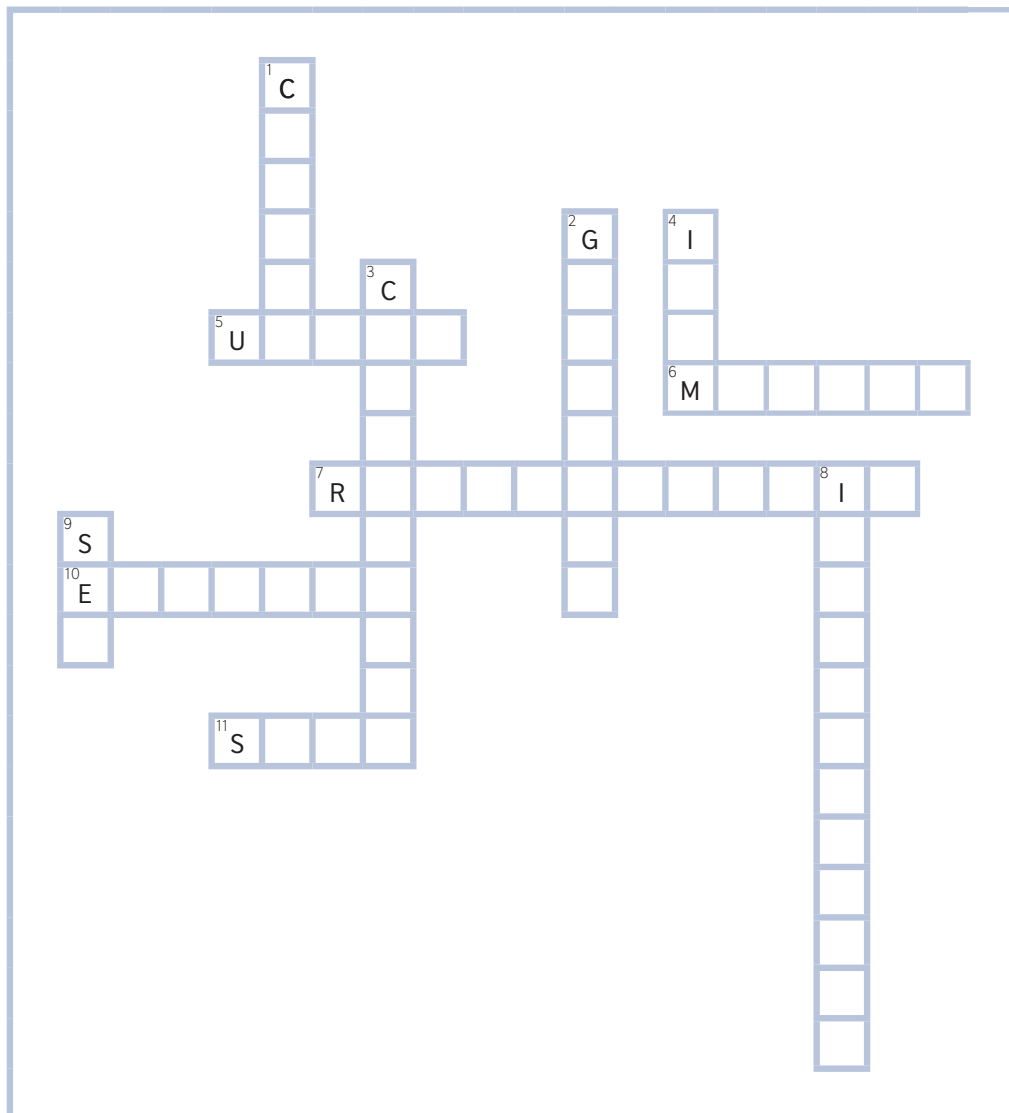
7. Complete the crossword by answering the following questions. All the correct answers are words about **sets**.

Across

5. The process of joining things or people together.
6. Something or someone that belongs to a club, organisation, or group.
7. The way in which two or more things are connected with each other.
10. An important basic part of something like a member of a group.
11. A written symbol that has a particular meaning, such as % for 'per cent' or \$ instead of the word 'dollar'.

Down

1. Something shared by all the members in a group.
2. A set of people or things that are considered as belonging together.
3. A gathering of objects together into a group.
4. A single thing from a group or list.
8. An area where two groups overlap or share members.
9. A group of things of the same type that belong together, or a collection of distinct objects.



8. Draw a line between each word about **items** and its correct definition.

nothing	The amount or quantity with which one thing is unlike another thing.
neither	Used when referring to two people or things when saying something negative that applies to both of them.
difference	Used for showing that a statement does not apply to anything or anyone else.
uncommon	Unusual, rare, or not shared between two groups.
unequivalent	Not of the same size, value, importance, or meaning as something else.
only	Not anything, without anything, or equal to zero.

9. Match the terms and definitions about **sets**. Write your answers in the grid below.

a)	compile	1	To mention someone or something when you are speaking or writing.
b)	deal with	2	To write out the different elements of a group, one after another.
c)	fall	3	To take action to do something, especially to solve a problem.
d)	form	4	To put something somewhere, especially in a careful or deliberate way.
e)	gather information	5	To make something (for example, a list) by bringing together information from different places.
f)	list a set of	6	To belong to a particular set is to ____ into a group.
g)	place	7	To look for data in different places and put them together.
h)	refer to	8	To make something exist, take shape, or develop.

Write answers here:

a)	b)	c)	d)	e)	f)	g)	h)

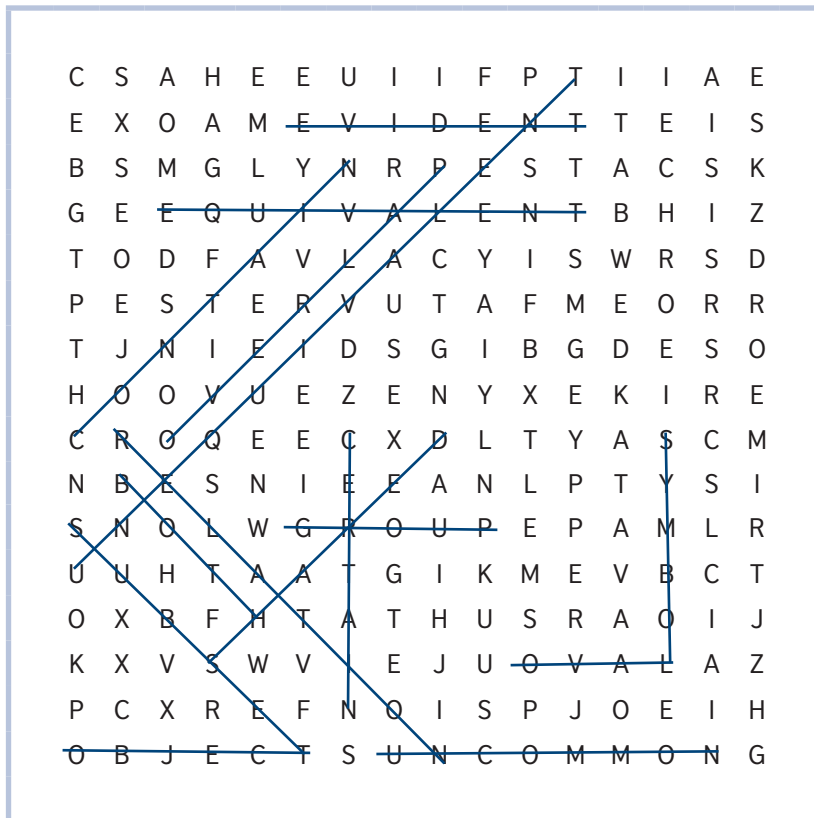
Glossary

both	/bəʊθ/ pronoun used for referring to two people or things, and that you are saying the same thing about the two of them.
certain	/ˈsɜː(r)t(ə)n/ adj having no doubts that something is true.
collection	/kəˈlekʃ(ə)n/ noun [C/U] a gathering of objects together into a group.
common	/ˈkɒmən/ adj shared by all the members in a group.
common members	/ˈkɒmən ˈmembə(r)z/ noun plural used to describe the members of a group which is made from two or more other groups based on their shared characteristics.
compile	/kəmˈpaɪl/ verb [T] make something such as a list by bringing together information from different places.
contain	/kənˈteɪn/ verb [T] include something, or to have it as a part.
deal with	/diːl wɪθ/ phr verb take action to do something, especially to solve a problem.
difference	/ˈdɪfrəns/ noun [C/U] the amount or quantity which one thing is unlike another thing.
element	/ˈelɪmənt/ noun [C] an important basic part of something like a member of a group.
empty set	/ˈempti set/ noun [C] a set with no elements symbolized by {} or \emptyset . The solution set for an equation that has no solution is called an empty set. It is also called a null set.
equivalent	/ˈkwɪvələnt/ adj with the same size, value, importance, or meaning as something else.
evident	/ˈevɪd(ə)nt/ adj easy to see, notice, or understand.
fall	/fɔːl/ verb [I] belong to a particular group or area of activity: <i>fall into a group</i> .
form	/fɔː(r)m/ verb [I/T] make something exist or develop.
gather information	/ˈgæðə(r) ɪnfə(r)ˈmeɪʃ(ə)n/ verb phrase look for data in different places and put them together.
group	/gruːp/ verb [I/T] put people or things into groups, especially groups in which the members are similar in some way.
grouping	/ˈgruːpɪŋ/əv/ noun [C] a set of people or things that are considered as a group.
intersection	/ˈɪntə(r), sekʃ(ə)n/ noun [C] an area used to define where two groups share members with similar characteristics.
intersection set	/ˈɪntə(r), sekʃ(ə)n set/ noun [C] the overlapping of two sets A and B is the set that contains all elements of A that also belong to B.
items	/ˈaɪtəmz/ noun plural things, usually several things in a group or on a list.
list a set of	/lɪst ə set ɒv/ verb phrase mention or write a list of things, one after another.

member	/ˈmembə(r)/ noun [C] something or someone who belongs to a club, organization, or a certain group.
neither	/ˈnaɪðə(r)/ conjunction referring to each of two people, things, actions, or ideas when saying something negative that applies to both of them.
neither... nor...	/ˈnaɪðə(r) nə:(r)/ used for showing that something is not true of two or more people, things, actions, qualities, or ideas.
non-common members	/nɒn ˈkɒmən ˈmembə(r)z/ noun plural used to describe the members of groups which do not have any shared characteristics.
nothing	/ˈnʌθɪŋ/ pronoun not anything, zero, without anything.
null set	/nʌl set/ noun [C] The solution set for an equation that has no solution is called a null set. It is also called an empty set.
object	/ˈɒbdʒekt/ noun [C] a thing that you can see and touch usually not alive and solid.
only	/ˈəʊnli/ adj adverb conjunction used for showing that a statement does not apply to anything or anyone else except the person, thing, action, place etc that you are mentioning.
oval	/ˈəʊv(ə)/ adj with a shape like a long narrow stretched circle.
overlap	/ˌəʊvə(r)ˈlæp/ verb [I/T] if groups or areas overlap some aspects are shared by both groups or areas.
place	/pleɪs/ verb [T] put something somewhere, especially in a careful or deliberate way.
refer to	/rɪˈfɜ:(r) tʊ/ verb [T] mention someone or something when you are speaking or writing.
relation	/rɪˈleɪ(ə)n/ noun [C/U] connection between two or more people or things.
relationship	/rɪˈleɪ(ə)nʃɪp/ noun [C] the way in which two or more things are connected with each other.
set	/set/ noun [C] a group of things of the same type that belong together, or a collection of distinct objects, considered as an object in its own right.
shared	/ʃeə(r)d/ adj common, together, in both or all groups.
sign	/saɪn/ noun [C/U] a written symbol that has a particular meaning, such as % meaning 'per cent' or \$ meaning 'dollar'.
subset	/ˈsʌb set/ noun [C] a small group of things that is a part of a larger group.
symbol	/ˈsɪmb(ə)/ noun [C] a mark, letter, number etc used to represent something, for example in chemistry or maths.
uncommon	/ʌnˈkɒmən/ adj unusual, rare, or not happening often.
unequivalent	/ˈʌniˈkwɪvələnt/ adj not of the same size, value, importance, or meaning as something else.
union	/ˈju:njən/ noun [C/U] the process of joining things or people together.
union set	/ˈju:njən set/ noun [C] a group which is made up of members shared by two or more groups.
Venn diagram	/ˈven ˌdaɪəgræm/ noun [C] a drawing of circles that cross over each other, showing features shared by different sets (=groups of numbers).

Key:

1. a) collection, b) members, c) elements, d) relationship, e) symbols, f) element, g) equal, h) equivalent, i) subset, j) empty
2. a) equal, b) elements, c) equivalent, d) unequivalent, e) empty, f) subset
3. a) common, b) uncommon, c) common, d) uncommon, e) common
4. a) grouping, b) form, c) form, d) items, e) shared, f) intersection, g) common, h) intersection, i) union, j) contains
- 5.



6. a) union set (3), b) Venn diagram (2), c) intersection set (1), d) common members (4), e) non-common members (5), f) null set (6)
7. **Across:** 5) union, 6) member, 7) relationship, 10) element, 11) sign; **Down:** 1) common, 2) grouping, 3) collection, 4) item, 8) intersection, 9) set

8.

nothing	The amount or quantity with which one thing is unlike another thing.
neither	Used when referring to two people or things when saying something negative that applies to both of them.
difference	Used for showing that a statement does not apply to anything, or anyone else.
uncommon	Unusual, rare, or not shared between two groups.
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only	Not anything, without anything, or equal to zero.

9. a) 5, b) 3, c) 6, d) 8, e) 7, f) 2, g) 4, h) 1