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Sets in mathematics, are simply a collection of distinct objects forming a group. A set can have any group of items, be it a collection of numbers, days of a week, types of vehicles, and so on. Every item in the set is called an element of the set. Curly brackets are used while writing a set. A very simple example of a set would be like this. Set A = {1, 2, 3, 4, 5}. In set theory, there are various notations to represent elements of a set. Sets are usually represented using a roster form or a set builder form. Let us discuss each of these terms in detail. Sets Definition In mathematics, a set is defined as a well-defined collection of objects. Sets are named and represented using capital letters. In the set theory, the elements that a set comprises can be any kind of thing: people, letters of the alphabet, numbers, shapes, variables, etc.Sets in Maths ExamplesSome standard sets in maths are:Set of natural numbers, = {1, 2, 3, ...}Set of whole numbers, W = {0, 1, 2, 3, ...}Set of integers, = {..., -3, -2, -1, 0, 1, 2, 3, ...}Set of rational numbers, = {p/q | q is an integer and q 0}Set of irrational numbers, ' = {x | x is not rational}Set of real numbers, = 'All these are infinite sets. But there can be finite sets as well. For example, the collection of even natural numbers less than 10 can be represented in the form of a set, A = {2, 4, 6, 8}, which is a finite set.Let us use this example to understand the basic terminology associated with sets in math.Elements of a SetThe items present in a set are called either elements or members of a set. The elements of a set are enclosed in curly brackets separated by commas. To denote that an element is contained in a set, the symbol '' is used. In the above example, 2 A. If an element is not a member of a set, then it is denoted using the symbol ''. For example, 3 A.Cardinal Number of a SetThe cardinal number, cardinality, or order of a set denotes the total number of elements in the set. For natural even numbers less than 10, n(A) = 4. Sets are defined as a collection of unique elements. One important condition to define a set is that all the elements of a set should be related to each other and share a common property. For example, if we define a set with the elements as the names of months in a year, then we can say that all the elements of the set are the months of the year.Representation of Sets in Set Theory There are different set notations used for the representation of sets in set theory. They differ in the way in which the elements are listed. The three set notations used for representing sets are:Semantic formRoster formSet builder formLet us understand each of these forms with an example.Set of first five even natural numbersSemantic FormRoster FormSet Builder FormA set of first five even natural numbers{2, 4, 6, 8, 10}{x | x 10 and x is even}Semantic FormSemantic notation describes a statement to show what are the elements of a set. For example, a set of the first five odd numbers.Roster FormThe most common form used to represent sets is the roster notation in which the elements of the sets are enclosed in curly brackets separated by commas. For example, Set B = {2,4,6,8,10}, which is the collection of the first five even numbers. In a roster form, the order of the elements of the set does not matter, for example, the set of the first five even numbers can also be defined as {2,6,8,10,4}. Also, if there is an endless list of elements in a set, then they are defined using a series of dots at the end of the last element. For example, infinite sets are represented as, X = {1, 2, 3, 4, 5 ...}, where X is the set of natural numbers. To sum up the notation of the roster form, please take a look at the examples below.Finite Roster Notation of Sets : Set A = {1, 2, 3, 4, 5} (The first five natural numbers)Infinite Roster Notation of Sets : Set B = {5, 10, 15, 20 ....} (The multiples of 5)Set Builder FormThe set builder notation has a certain rule or a statement that specifically describes the common feature of all the elements of a set. The set builder form uses a vertical bar in its representation, with a text describing the character of the elements of the set. For example, A = { k | k is an even number, k 20}. The statement says, all the elements of set A are even numbers that are less than or equal to 20. Sometimes a ":" is used in the place of the "|".Visual Representation of Sets Using Venn DiagramVenn Diagram is a pictorial representation of sets, with each set represented as a circle. The elements of a set are present inside the circles. Sometimes a rectangle encloses the circles, which represents the universal set. The Venn diagram represents how the given sets are related to each other.Sets Symbols Set symbols are used to define the elements of a given set. The following table shows the set theory symbols and their meaning.SymbolsMeaning{ }Symbol of setUUniversal setn(X)Cardinal number of set Xb A'b' is an element of set Aa B'a' is not an element of set BNull or empty setA U BSet A union set BA BSet A intersection set BA BSet A is a subset of set BB ASet B is the superset of set ATypes of Sets There are different types of sets in set theory. Some of these are singleton, finite, infinite, empty, etc.Singleton SetsA set that has only one element is called a singleton set or also called a unit set. Example, Set A = { k | k is an integer between 3 and 5} which is A = {4}.Finite SetsAs the name implies, a set with a finite or countable number of elements is called a finite set. Example, Set B = {k | k is a prime number less than 20}, which is B = {2,3,5,7,11,13,17,19}Infinite SetsA set with an infinite number of elements is called an infinite set. Example: Set C = {Multiples of 3}.Empty or Null SetsA set that does not contain any element is called an empty set or a null set. An empty set is denoted using the symbol ''. It is read as 'phi'. Example: Set X = { }.Equal SetsIf two sets have the same elements in them, then they are called equal sets. Example: A = {1,2,3} and B = {1,2,3}. Here, set A and set B are equal sets. This can be represented as A = B.Unequal SetsIf two sets have at least one different element, then they are unequal sets. Example: A = {1,2,3} and B = {2,3,4}. Here, set A and set B are unequal sets. This can be represented as A B.Equivalent SetsTwo sets are said to be equivalent sets when they have the same number of elements, though the elements are different. Example: A = {1,2,3,4} and B = {a,b,c,d}. Here, set A and set B are equivalent sets since n(A) = n(B)Overlapping SetsTwo sets are said to be overlapping if at least one element from set A is present in set B. Example: A = {2,4,6} B = {4,8,10}. Here, element 4 is present in set A as well as in set B. Therefore, A and B are overlapping sets.Disjoint SetsTwo sets are disjoint if there are no common elements in both sets. Example: A = {1,2,3,4} B = {5,6,7,8}. Here, set A and set B are disjoint sets.Subset and SupersetFor two sets A and B, if every element in set A is present in set B, then set A is a subset of set B(A B) and in this case, B is the superset of set A(B A). Example: Consider the sets A = {1,2,3} and B = {1,2,3,4,5,6}. Here:A B, since all the elements in set A are present in set B.B A denotes that set B is the superset of set A.Universal SetA universal set is the collection of all the elements regarding a particular subject. The universal set is denoted by the letter 'U'. Example: Let U = {The list of all road transport vehicles}. Here, a set of cars is a subset for this universal set, the set of cycles, trains are all subsets of this universal set.Power SetsPower set is the set of all subsets that a set could contain. Example: Set A = {1,2,3}. Power set of A is = {, {1}, {2}, {3}, {1,2}, {2,3}, {1,3}, {1,2,3}}.Operations on Sets Some important operations on sets in set theory include union, intersection, difference, the complement of a set, and the cartesian product of a set. A brief explanation of set operations is as follows.Union of SetsUnion of sets, which is denoted as A U B, lists the elements in set A and set B or the elements in both set A and set B. For example, {1, 3} {1, 4} = {1, 3, 4}Intersection of SetsThe intersection of sets which is denoted by A B lists the elements that are common to both set A and set B. For example, {1, 2} {2, 4} = {2}Set DifferenceSet difference which is denoted by A - B, lists the elements in set A that are not present in set B. For example, A = {2, 3, 4} and B = {4, 5, 6}. A - B = {2, 3}.Set ComplementSet complement which is denoted by A', is the set of all elements in the universal set that are not present in set A. In other words, A' is denoted as U - A, which is the difference in the elements of the universal set and set A.Cartesian Product of SetsThe cartesian product of two sets which is denoted by A B, is the product of two non-empty sets, wherein ordered pairs of elements are obtained. For example, {1, 3} {1, 3} = {(1, 1), (1, 3), (3, 1), (3, 3)}.In the above figure, the shaded portions in "blue" show the set that they are labelled with.Sets Formulas in Set Theory Sets find their application in the field of algebra, statistics, and probability. There are some important set theory formulas in set theory as listed below.For any two overlapping sets A and B,n(A U B) = n(A) + n(B) - n(A B)n (A B) = n(A) + n(B) - n(A U B)n(A) = n(A U B) + n(A B) - n(B)n(B) = n(A U B) + n(A B) - n(A)n(A - B) = n(A U B) - n(B)n(A - B) = n(A) - n(A B)For any two sets A and B that are disjoint,n(A U B) = n(A) + n(B)A B = n(A - B) = n(A)Properties of Sets Similar to numbers, sets also have properties like associative property, commutative property, and so on. There are six important properties of sets. Given, three sets A, B, and C, the properties for these sets are as follows. Cuemath is one of the world's leading math learning platforms that offers LIVE 1-to-1 online math classes for grades K-12. Our mission is to transform the way children learn math, to help them excel in school and competitive exams. Our expert tutors conduct 2 or more live classes per week, at a pace that matches the child's learning needs.Example 1: Find the elements of the sets represented as follows and write the cardinal number of each set. a) Set A is the first 8 multiples of 7 b) Set B = {a,e,i,o,u} c) Set C = {x | x are even numbers between 20 and 40}Solution:a) Set A = {7,14,21,28,35,42,49,56}. These are the first 8 multiples of 7.Since there are 8 elements in the set, cardinal number n (A) = 8b) Set B = {a,e,i,o,u}. There are five elements in the set,Therefore, the cardinal number of set B, n(B) = 5. c) Set C = {22,24,26,28,30,32,34,36,38}. These are the even numbers between 20 and 40, which make up the elements of the set C.Therefore, the cardinal number of set C, n(C) = 9.Answer: (a) 8 (b) 5 (c) 9 Example 2: If Set A = {a,b,c}, Set B = {a,b,c,p,q,r}, U = {a,b,c,d,p,q,r,s}, find the following using sets formulas, a) A U B b) A B c) A' d) Is A B? (Here 'U' is the universal set).Solution:a) A U B = writing the elements of A and B together in one set by removing duplicates = {a,b,c,p,q,r}b) A B = writing common elements of A and B in a set = {a,b,c}c) A' = writing elements of U that are NOT present in A = {d,p,q,r,s}d) A B, (Set A is a subset of set B) since all the elements in set A are present in set B.Answer:(a) {a,b,c,p,q,r} (b) {a,b,c} (c) {d,p,q,r,s} (d) YesExample 3: Express the given set in set-builder form: A = {2, 4, 6, 8, 10, 12, 14}Solution: Given: A = {2, 4, 6, 8, 10, 12, 14}Using sets notations, we can represent the given set A in set-builder form as,A = {x | x is an even natural number less than 15}Answer: A = {x | x is an even natural number less than 15} View More >go to slidego to slidego to slideFAQs on Sets Sets are a collection of distinct elements, which are enclosed in curly brackets, separated by commas. The list of items in a set is called the elements of a set. Examples are a collection of fruits, a collection of pictures. Sets are represented by the symbol { }. i.e., the elements of the set are written inside these brackets. Example: Set A = {a,b,c,d}. Here, a,b,c, and d are the elements of set A.What are Different Sets Notations to Represent Sets?Sets can be represented in three ways. Representing sets means a way of listing the elements of the set. They are as follows.Semantic Notation: The elements of a set are represented by a single statement. For example, Set A is the number of days in a week.Roster Notation: This form of representation of sets uses curly brackets to list the elements of the set. For example, Set A = {10,12,14,16,18}}Set Builder Notation: A set builder form represents the elements of a set by a common rule or a property. For example, {x | x is a prime number less than 20}What are the Types of Sets?Sets differ from each depending upon elements present in them. Based on this, we have the following types of sets. They are singleton sets, finite and infinite sets, empty or null sets, equal sets, unequal sets, equivalent sets, overlapping sets, disjoint sets, subsets, supersets, power sets, and universal sets.What are the Properties of Sets in Set-Theory?Different properties associated with sets in math are,Commutative Property: A U B = B U A and A B = B AAssociative Property: (A B) C = A (B C) and (A U B) U C = A U (B U C)Distributive Property: A U (B C) = (A U B) (A U C) and A (B U C) = (A B) U (A C)Identity Property: A U = A and A U = AComplement Property: A U A' = UIdempotent Property: A A = A and A U A = AWhat is the Union of Sets?The union of two sets A and B are the elements from both set A and B, or both combined together. It is denoted using the symbol 'U'. For example, if set A = {1,2,3} and set B = {4,5,6}, then A U B = {1,2,3,4,5,6}. A U B is read as 'A union B'.What is the Intersection of Sets?The intersection of two sets A and B are the elements that are common to both set A and B. It is denoted using the symbol ''. For example, if set A = {1,2,3} and set B = {3,4,5}, then A B = {3}. A B is read as 'A intersection B'.What are Subsets and Supersets?If every element in a set A is present in set B, then set B is the superset of set A and set A is a subset of set B. Example: A = {1,4,5} B = {1,2,3,4,5,6}, here since all elements of set A are present in set B A B and B A.What are Universal Sets?A universal set, denoted by the letter 'U', is the collection of all the elements in regard to a particular subject. Example: Let U = {All types of cycles}. Here, a set of cycles of a specific company is a subset of this universal set.What Does Sets Class 11 Contain?The sets in class 11 is an important chapter that deals with various components of set theory. It starts with definition of sets, and extends to types of sets, properties of sets, set operations, etc. It also has some real-life applications related to sets. To solve more applications related to sets class 11, click here.Also Check: What is Complement in Sets?The complement of a set which is denoted by A', is the set of all elements in the universal set that are not present in set A. In other words, A' is denoted as U - A, which is the difference in the elements of the universal set and set A.What is Cartesian Product in Sets?Cartesian product of two sets, denoted by AB, is the product of two non-empty sets, wherein ordered pairs of elements are obtained. For example, if A = {1,2} and B = {3,4}, then AB = {(1,3), (1,4), (2,3), (2,4)}.What is the Use of Venn Diagram in Set Theory?Venn Diagram is a pictorial representation of the relationship between two or more sets. Circles are used to represent sets. Each circle represents a set. A rectangle that encloses the circles represents the universal set.to put (something or someone) in a particular place.to set a vase on a table.Synonyms: plant, situate, locate, positionto place in a particular position or posture.Set the baby on his feet.to place in some relation to something or someone.We set a supervisor over the new workers.to put into some condition.to put or apply.to put in the proper position.to set a chair back on its feet.to put in the proper or desired order or condition for use.to distribute or arrange china, silver, etc., for use on (a table).to set the table for dinner.to place (the hair, especially when wet) on rollers, in clips, or the like, so that the hair will assume a particular style.to put (a price or value) upon something.He set $7500 as the right amount for the car.The teacher sets a high value on neatness.to fix the value of at a certain amount or rate; value.He set the car at $500.She sets neatness at a high value.Synonyms: rate, price, evaluate, appraise, estimateto post, station, or appoint for the purpose of performing some duty.to set spies on a person.to determine or fix definitely.to resolve or decide upon.to cause to pass into a given state or condition.to set one's mind at rest;to set a prisoner free.to direct or settle resolutely or wishfully.to set one's mind to a task.to present as a model; place before others as a standard.to establish for others to follow.to prescribe or assign, as a task.to adjust (a mechanism) so as to control its performance.to adjust the hands of (a clock or watch) according to a certain standard.I always set my watch by the clock in the library.to adjust (a timer, alarm of a clock, etc.) so as to sound when desired.He set the alarm for seven o'clock.to fix or mount (a gem or the like) in a frame or setting.to ornament or stud with gems or the like.a bracelet set with pearls.to cause to sit; seat.to set a child in a high chair.to put (a hen) on eggs to hatch them.to place (eggs) under a hen or in an incubator for hatching.to place or plant firmly.to set a flagpole in concrete.to put into a fixed, rigid, or settled state, as the face, muscles, etc.to fix at a given point or calibration.to set the dial on an oven;to set a micrometer.to tighten (often followed byup).to cause to take a particular direction.to set one's course to the south.Surgery.to put (a broken or dislocated bone) back in position.(of a hunting dog) to indicate the position of (game) by standing stiffly and pointing with the muzzle.Music.to fit, as words to music.to arrange for musical performance.to arrange (music) for certain voices or instruments.Theater.to arrange the scenery, properties, lights, etc., on (a stage) for an act or scene.to prepare (a scene) for dramatic performance.Nautical.to spread and secure (a sail) so as to catch the wind.Printing.to arrange (type) in the order required for printing.to put together types corresponding to (copy); compose in type.Baking.to put aside (a substance to which yeast has been added) in order that it may rise.to change into curd.to cause (glue, mortar, or the like) to become fixed or hard.to urge, goad, or encourage to attack.to set the hounds on a trespasser.Bridge.to cause (the opposing partnership or their contract) to fall short.We set them two tricks at four spades.Only perfect defense could set four spades.to affix or apply, as by stamping.The king set his seal to the decree.to fix or engage (a fishhook) firmly into the jaws of a fish by pulling hard on the line once the fish has taken the bait.to sharpen or put a keen edge on (a blade, knife, razor, etc.) by honing or grinding.to fix the length, width, and shape of (yarn, fabric, etc.).Carpentry.to sink (a nail head) with a nail set.to bend or form to the proper shape, as a saw tooth or a spring.to bend the teeth of (a saw) outward from the blade alternately on both sides in order to make a cut wider than the blade itself.to pass below the horizon; sink.The sun sets early in winter.to decline; wane.to assume a fixed or rigid state, as the countenance or the muscles.(of the hair) to be placed temporarily on rollers, in clips, or the like, in order to assume a particular style.Long hair sets more easily than short hair.to become firm, solid, or permanent, as mortar, glue, cement, or a dye, due to drying or physical or chemical change.Synonyms: harden, congeal, solidifyto sit on eggs to hatch them, as a hen.to hang or fit, as clothes.to begin to move; start (usually followed by forth, out, off, etc.).(of a flower's ovary) to develop into a fruit.(of a hunting dog) to indicate the position of game.to have a certain direction or course, as a wind, current, or the like.Nautical.(of a sail) to be spread so as to catch the wind.Printing.(of type) to occupy a certain width.This copy sets to forty picas.Nonstandard.sit.the act or state of setting or the state of being set.a collection of articles designed for use together.a set of china;a chess set.a collection, each member of which is adapted for a special use in a particular operation.a set of golf clubs;a set of carving knives.a number, group, or combination of things of similar nature, design, or function.a series of volumes by one author, about one subject, etc.a number, company, or group of persons associated by common interests, occupations, conventions, or status.a set of murderous thieves;the smart set.the fit, as of an article of clothing.fixed direction, bent, or inclination.The set of his mind was obvious.bearing or carriage.the set of one's shoulders.the assumption of a fixed, rigid, or hard state, as by mortar or glue.the arrangement of the hair in a particular style.How much does the beauty salon charge for a shampoo and set?a plate for holding a tool or die.an apparatus for receiving radio or television programs; receiver.Philately.a group of stamps that form a complete series.Tennis.a unit of a match, consisting of a group of not fewer than six games with a margin of at least two games between the winner and loser.He won the match in straight sets of 63, 64, 64.a construction representing a place or scene in which the action takes place in a stage, motion-picture, or television production.Machinery.the bending out of the points of alternate teeth of a saw in opposite directions.a permanent deformation or displacement of an object or part.a tool for giving a certain form to something, as a saw tooth.a chisel having a wide blade for dividing bricks.Horticulture.a young plant, or a slip, tuber, or the like, suitable for planting.Dance.the number of couples required to execute a quadrille or the like.a series of movements or figures that make up a quadrille or the like.Music.a group of pieces played by a band, as in a night club, and followed by an intermission.the period during which these pieces are played.Bridge.a failure to take the number of tricks specified by one's contract.Our being vulnerable made the set even more costly.Nautical.the direction of a wind, current, etc.the form or arrangement of the sails, spars, etc., of a vessel.suit.Psychology.a temporary state of an organism characterized by a readiness to respond to certain stimuli in a specific way.Mining.a timber frame bracing or supporting the walls or roof of a shaft or stope.Carpentry.nail set.Mathematics.a collection of objects or elements classed together.Printing.the width of a body of type.sett.fixed or prescribed beforehand.specified; fixed.The hall holds a set number of people.deliberately composed; customary.fixed; rigid.resolved or determined; habitually or stubbornly fixed.to be set in one's opinions.Synonyms: obstinate, stubborncompletely prepared; ready.Also get set! (in calling the start of a race).to write or to copy or record in writing or printing.to consider; estimate.to set someone down as a fool.to attribute; ascribe.to set a failure down to bad planning.to put in a position of rest on a level surface.to humble or humiliate.to land an airplane.We set down in a heavy fog.(in horse racing) to suspend (a jockey) from competition because of some offense or infraction of the rules.Also set upon. to attack or cause to attack.to set one's dog on a stranger.to instigate; incite.to save or keep for future use.to begin a journey or course.to undertake; attempt.He set out to prove his point.to design; plan.to define; describe.to set out one's arguments.to plant.to set out petunias and pansies.to lay out (the plan of a building) in actual size at the site.to lay out (a building member or the like) in actual size.to begin on; start.to undertake; attempt.to assault; attack.to cause to be hostile or antagonistic.to compare or contrast.The advantages must be set against the disadvantages.to set to a later setting or time.Set your clocks ahead one hour.to begin to prevail; arrive.(of winds or currents) to blow or flow toward the shore.to give an account of; state; describe.He set forth his theory in a scholarly report.to begin a journey; start.Columbus set forth with three small ships.to put to one side; reserve.The clerk set aside the silver brooch for me.to dismiss from the mind; reject.to prevail over; discard; annul.to hinder; impede.to turn the hands of (a watch or clock) to show an earlier time.When your plane gets to California, set your watch back two hours.to reduce to a lower setting.Set back the thermostat before you go to bed.to put upright; raise.to put into a high or powerful position.to construct; assemble; erect.to be assembled or made ready for use.exercise equipment that sets up in a jiffy.to inaugurate; establish.to enable to begin in business; provide with means.Informalto make a gift of; treat, as to drinks.Informalto stimulate; elate.to propound; plan; advance.to bring about; cause.to become firm or hard, as a glue or cement.a paint that sets up within five minutes.to lead or lure into a dangerous, detrimental, or embarrassing situation, as by deceitful prearrangement or connivance.to entrap or frame, as an innocent person in a crime or a criminal suspect in a culpable circumstance in order to achieve an arrest.to arrange the murder or execution of.His partner set him up with the mob.Bridgeto establish (a suit).to reserve for a particular purpose.to cause to be noticed; distinguish.Her bright red hair sets her apart from her sisters.to make a vigorous effort; apply oneself to work; begin.to begin to fight; contend.to cause to become ignited or to explode.to begin; start.to intensify or improve by contrast.to begin a journey or trip; depart.to put or place in position or into a specified state or conditionto set a book on the tableto set someone free(also intr; foll by to or on) to put or be put (to); apply or be appliedhe set fire to the housethey set the dogs on the scentto put into order or readiness for use; prepareto set a trapto set the table for dinner(also intr) to put, form, or be formed into a jelled, firm, fixed, or rigid statethe jelly set in three hours(also intr) to put or be put into a position that will restore a normal stateto adjust (a clock or other instrument) to a positionto determine or establishwe have set the date for our weddingto prescribe or allot (an undertaking, course of study, etc)the examiners have set ``Paradise Lost''to arrange in a particular fashion, esp an attractive oneshe set her hairthe jeweller set the diamonds in silver(of clothes) to hang or fit (well or badly) when wornAlso: set to music.to provide music for (a poem or other text to be sung)Also: set up.printing to arrange or produce (type, film, etc) from (text or copy); composeto arrange (a stage, television studio, etc) with scenery and propsto describe or present (a scene or the background to a literary work, story, etc) in wordshis novel is set in Russiato present as a model of good or bad behaviour (esp in the phrases set an example, set a good example, set a bad example)to value (something) at a specified price or estimation of worthhe set a high price on his services(foll by at) to price (the value of something) at a specified sumhe set his services at 300(also intr) to give or be given a particular directionhis course was set to the East(also intr) to rig (a sail) or (of a sail) to be rigged so as to catch the wind(intr) (of the sun, moon, etc) to disappear beneath the horizonto leave (dough, etc) in one place so that it may proveto sharpen (a cutting blade) by grinding or honing the angle adjacent to the cutting edgeto displace alternate teeth of (a saw) to opposite sides of the blade in order to increase the cutting efficiencyto sink (the head of a nail) below the surface surrounding it by using a nail setcomputing to give (a binary circuit) the value 1(of plants) to produce (fruits, seeds, etc) after pollination or (of fruits or seeds) to develop after pollinationto plant (seeds, seedlings, etc)to place (a hen) on (eggs) for the purpose of incubation(intr) (of a gun dog) to turn in the direction of game, indicating its presenceto let or leasebridge to defeat (one's opponents) in their attempt to make a contracta dialect word for sitto seeCollins English Dictionary Complete & Unabridged 2012 Digital Edition William Collins Sons & Co. Ltd. 1979, 1986 HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009, 2012the act of setting or the state of being seta condition of firmness or hardnessbearing, carriage, or posturethe set of a gun dog when pointingthe fit or hang of a garment, esp when wornthe scenery and other props used in and identifying the location of a stage or television production, film, etcAlso called: set width.printingthe width of the body of a piece of typethe width of the lines of type in a page or columnnauticalthe cut of the sails or the arrangement of the sails, spars, rigging, etc, of a vesselthe direction from which a wind is blowing or towards which a tide or current is movingpsychol a temporary bias disposing an organism to react to a stimulus in one way rather than in othersa seedling, cutting, or similar part that is ready for plantinga blacksmith's tool with a short head similar to a cold chisel set transversely onto a handle and used, when struck with a hammer, for cutting off lengths of iron barsSee nail setthe direction of flow of watera mechanical distortion of shape or alignment, such as a bend in a piece of metalthe penetration of a driven pile for each blow of the drop hammera variant spelling of settCollins English Dictionary Complete & Unabridged 2012 Digital Edition William Collins Sons & Co. Ltd. 1979, 1986 HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009, 2012fixed or established by authority or agreement(usually postpositive) rigid or inflexibleunmoving; fixeda set expression on his faceconventional, artificial, or stereotyped, rather than spontaneousshe made her apology in set phrases(postpositive; foll by on or upon) resolute in intention(of a book, etc) prescribed for students' preparation for an examinationCollins English Dictionary Complete & Unabridged 2012 Digital Edition William Collins Sons & Co. Ltd. 1979, 1986 HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009, 2012a number of objects or people grouped or belonging together, often forming a unit or having certain features or characteristics in commona set of coinsJohn is in the top set for mathsa group of people who associate together, esp a cliquemaths logicAlso called: class.a collection of numbers, objects, etc, that is treated as an entity: 3, the moon is the set the two members of which are the number 3 and the moon(in some formulations) a class that can itself be a member of other classesany apparatus that receives or transmits television or radio signalstennis squash badminton one of the units of a match, in tennis one in which one player or pair of players must win at least six gamesthe number of couples required for a formation dancea series of figures that make up a formation dancea band's or performer's concert repertoire on a given occasionthe set included no new numbersa continuous performanceCollins English Dictionary Complete & Unabridged 2012 Digital Edition William Collins Sons & Co. Ltd. 1979, 1986 HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009, 2012(intr) (in square dancing and country dancing) to perform a sequence of steps while facing towards another dancer(usually tr) to divide into setsin this school we set our older pupils for EnglishCollins English Dictionary Complete & Unabridged 2012 Digital Edition William Collins Sons & Co. Ltd. 1979, 1986 HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009, 2012A collection of distinct elements that have something in common. In mathematics, sets are commonly represented by enclosing the members of a set in curly braces, as {1, 2, 3, 4, 5}, the set of all positive integers from 1 to 5.The verbs set and sit1 are similar in form and meaning but different in grammatical use. Set is chiefly transitive and takes an object: Set the dish on the shelf. Its past tense and past participle are also set : Yesterday he set three posts for the fence. The judge has set the date for the trial. Set also has some standard intransitive uses, as to pass below the horizon (The sun sets late in the northern latitudes during the summer) and to become firm, solid, etc. (This glue sets quickly). The use of set for sit, to be seated, is nonstandard: Pull up a chair and set by me. Sit is chiefly intransitive and does not take an object: Let's sit here in the shade. Its past tense and past participle are sat : They sat at the table for nearly two hours. Have they sat down yet? Transitive uses of sit include to cause to sit (Pull up a chair and sit yourself down) and to provide seating for (The waiter sat us near the window).interset verb (used with object)interset, intersettingmisset verbmisset, missettingself-set adjectiveOrigin of set1First recorded before 900; Middle English verb setten, Old English settan; cognate with Old Norse setja, German setzen, Gothic satjan, all from Germanic satjan, causative of setjan to sit; Middle English noun in senses denoting the action of setting or the state of being set, from set, set(t)e, derivative of the verb and its past participle; in senses denoting a group, from Middle English sette, from Old French, from Latin secta (in later use influenced by the verb and Middle Low German gesette set, suite); sit 1; sectOrigin of set1Old English settan, causative of sittan to sit ; related to Old Frisian setta, Old High German sezzanOrigin of set2C14 (in the obsolete sense: a religious sect): from Old French sette, from Latin secta sect ; later sense development influenced by the verb set 1Idiomsset one's face against. face.set store by. store.set forward, to turn the hands of (a watch or clock) to show a later time.When your plane lands in New York, set your watch forward two hours.all set, in readiness; prepared.They were at the starting line and all set to begin.Examples have not been reviewed.This could commit the world to breaching the target set by the Paris agreement, the researchers say, though the planet would probably not pass 1.5C of human-caused warming until a few years later.The Bank rate is the key benchmark for lenders setting the cost of borrowing, and for banks and building societies deciding what returns to pay to savers.This is an individual who got close to Tyler Perry for what now appears to be nothing more than setting up a scam, Perrys attorney Matthew Boyd said in a statement to The Times."We now need to set targets in legislation so that everyone knows what we're aiming for," she said.But it's the government which sets the criteria for who should receive it.Definitions and idiom definitions from Dictionary.com Unabridged, based on the Random House Unabridged Dictionary, Random House, Inc. 2023Idioms from The American Heritage Idioms Dictionary copyright 2002, 2001, 1995 by Houghton Mifflin Harcourt Publishing Company. Published by Houghton Mifflin Harcourt Publishing Company.Sesto San GiovannisetaBrowse#aabbccddeeffgghhiijjkkllmmnnooppqqrrssttuuvvwwxxyyzzAboutCareersContact usCookies, terms, & privacyHelpFollow usGet the Word of the Day every day! 2025 Dictionary.com, LLC There are several useful operations one can use to combine, compare, and analyze sets. Union: The union of two sets, denoted \(\cup\) (which is called a cup), refers to the set of all the elements that are in at least one of the two sets. For example, \(\{1,2,3\} \cup \{3,4,5\} = \{1,2,3,4,5\}.\) In Boolean logic, union is expressed as a logical OR. Intersection: The intersection of two sets, denoted \(\cap\) (which is called a cap), refers to the set of the elements that are in both sets. For example, \(\{1,2,3\} \cap \{3,4,5\} = \{3\}.\) In Boolean logic, intersection is expressed as a logical AND. Complement (Absolute): Denoted \(^c\), the absolute complement refers to the set of all the elements that are not in a set. If we consider the universal set, \(U\), as the set of all integers, \(\{ 1, 2, 3 \}^c \) would represent all integers except for 1, 2, and 3. In Boolean logic, complement is expressed as a logical NOT. Complement (Relative): Relative complement, denoted \(\backslash \), refers to the set of elements that are in the first set but not in the second. For example, \(\{1,2,3\} \backslash \{3,4,5\} = \{1,2\}.\) Relative complement can also be expressed by the minus sign, and thus \(\{1,2,3\}-\{3,4,5\}=\{1,2\}.\) Symmetric Difference: Symmetric difference, denoted \(\triangle \), refers to the set of elements which are in one of the two sets but not both. For example, \(\{1,2,3\} \triangle \{3,4,5\} = \{1,2,4,5\}.\) In Boolean logic, symmetric difference is expressed as a logical XOR. The symbol \(\cup\) refers to the union of the two sets. Thus, \(\{2,4,6\} \cup \{3,5,7\} \) is \(\{2,3,4,5,6,7\}.\ _ \square \) Given the following two sets \[\begin{align}A &= \{ 2, a^2-4a+7 \} \\B &= \{ a+1, a^2+1, a^2-1 \},\end{align} \] if \(A \cap B = \{4\} ,\) what is \(a?\) From \(A \cap B = \{4\}, \) we know that both sets \(A\) and \(B\) must have \(4\) as an element. Therefore, for set \(A\) we have \[\begin{align}a^2-4a+7&=4 \\(a-1)(a-3)&=0 \\\Rightarrow a&= 1\text{ or }3.\end{align} \] If the value of \(a\) is 1, set \(B\) is \[\begin{align}B &= \{a+1, a^2+1, a^2-1\} \\ &= \{1+1, 1^2+1, 1^2-1\} \\&=\{ 2,2,0\} .\end{align} \] Then \(A \cap B = \{2\} eq \{4\}. \) If the value of \(a\) is 3, set \(B\) is \[\begin{align}B &= \{a+1, a^2+1, a^2-1\} \\&= \{3+1, 3^2+1, 3^2-1\} \\&=\{ 4,10,8\} .\end{align} \] Then \(A \cap B = \{4\}. \) Thus, the value of \(a\) that satisfies \(A \cap B = \{4\}\) is \(a=3.\ _ \square \)What is \(\{2,4,6,8,10,12\} \triangle \{3,6,9,12,15\} ?\) The symbol \(\triangle\) denotes symmetric difference, which means the set of elements which are in one of the two sets but not both. Thus, \(\{2,4,6,8,10,12\} \triangle \{3,6,9,12,15\} \) is \(\{ 2,3,4,8,9,10,15 \} .\ _ \square \) Forget everything you know about numbers. In fact, forget you even know what a number is. This is where mathematics starts. Instead of math with numbers, we will now think about math with "things". What is a set? Well, simply put, it's a collection. First we specify a common property among "things" (we define this word later) and then we gather up all the "things" that have this common property. For example, the items you wear: hat, shirt, jacket, pants, and so on. I'm sure you could come up with at least a hundred. This is known as a set. Or another example is types of fingers. This set includes index, middle, ring, and pinky. So it is just things grouped together with a certain property in common. Notation There is a fairly simple notation for sets. We simply list each element (or "member") separated by a comma, and then put some curly brackets around the whole thing: The curly brackets { } are sometimes called "set brackets" or "braces". This is the notation for the two previous examples: {socks, shoes, watches, shirts, ...}{index, middle, ring, pinky} Notice how the first example has the "..." (three dots together). The three dots ... are called an ellipsis, and mean "continue on". So that means the first example continues on ... for infinity. (OK, there isn't really an infinite amount of things you could wear, but I'm not entirely sure about that! After an hour of thinking of different things, I'm still not sure. So let's just say it is infinite for this example.) So: The first set {socks, shoes, watches, shirts, ...} we call an infinite set, the second set {index, middle, ring, pinky} we call a finite set. But sometimes the "..." can be used in the middle to save writing long lists: Example: the set of letters: {a, b, c, ..., x, y, z} In this case it is a finite set (there are only 26 letters, right?) Numerical Sets So what does this have to do with mathematics? When we define a set, all we have to specify is a common characteristic. Who says we can't do so with numbers? Set of even numbers: {..., 4, 2, 0, 2, 4, ...}Set of odd numbers: {..., 3, 1, 1, 3, ...}Set of prime numbers: {2, 3, 5, 7, 11, 13, 17, ...}Positive multiples of 3 that are less than 10: {3, 6, 9}And so on. We can come up with all different types of sets. We can also define a set by its properties, such as {x|x>0} which means "the set of all x's, such that x is greater than 0", see Set-Builder Notation to learn more. And we can have sets of numbers that have no common property, they are just defined that way. For example: {2, 3, 6, 828, 3839, 8827}{4, 5, 6, 10, 21}{2, 949, 48282, 42882959, 119484203}Are all sets that I just randomly banged on my keyboard to produce. Why are Sets Important? Sets are the fundamental property of mathematics. Now as a word of warning, sets, by themselves, seem pretty pointless. But it's only when we apply sets in different situations do they become the powerful building block of mathematics that they are. Math can get amazingly complicated quite fast. Graph Theory, Abstract Algebra, Real Analysis, Complex Analysis, Linear Algebra, Number Theory, and the list goes on. But there is one thing that all of these share in common: Sets. Universal Set At the start we used the word "things" in quotes. We call this the universal set. It's a set that contains everything. Well, not exactly everything. Everything that is relevant to our question. In Number Theory the universal set is all the integers, as Number Theory is simply the study of integers. But in Calculus (also known as real analysis), the universal set is almost always the real numbers. And in complex analysis, you guessed it, the universal set is the complex numbers. Some More Notation When talking about sets, it is fairly standard to use Capital Letters to represent the set, and lowercase letters to represent an element in that set.So for example, A is a set, and a is an element in A. Same with B and b, and C and c. Now you don't have to listen to the standard, you can use something like m to represent a set without breaking any mathematical laws (watch out, you can get years in math jail for dividing by 0), but this notation is pretty nice and easy to follow, so why not? Also, when we say an element a is in a set A, we use the symbol to show it.And if something is not in a set use . Example: Set A is {1,2,3}. We can see that 1 A, but 5 A Equality Two sets are equal if they have precisely the same members. Now, at first glance they may not seem equal, so we may have to examine them closely! Example: Are A and B equal where: A is the set whose members are the first four positive whole numbers B = {4, 2, 1, 3} Let's check. They both contain 1. They both contain 2. And 3, And 4. And we have checked every element of both sets, so: Yes, they are equal! And the equals sign (=) is used to show equality, so we write: A = B A is {1, 2, 3} B is {3, 1, 2} Yes, they are equal! They both contain exactly the members 1, 2 and 3. It doesn't matter where each member appears, so long as it is there. Subsets When we define a set, if we take pieces of that set, we can form what is called a subset. A subset of this is {1, 2, 3}. Another subset is {3, 4} or even another is {1}, etc. But {1, 6} is not a subset, since it has an element (6) which is not in the parent set. In general: A is a subset of B if and only if every element of A is in B. So let's use this definition in some examples. 1 is in A, and 1 is in B as well. So far so good. 3 is in A and 3 is also in B. 4 is in A, and 4 is in B. That's all the elements of A, and every single one is in B, so we're done. Yes, A is a subset of B Note that 2 is in B, but 2 is not in A. But remember, that doesn't matter, we only look at the elements in A. Let's try a harder example. Well, we can't check every element in these sets, because they have an infinite number of elements. So we need to get an idea of what the elements look like in each, and then compare them. The sets are: A = {..., 8, 4, 0, 4, 8, ...} B = {..., 8, 6, 4, 2, 0, 2, 4, 6, 8, ...} By pairing off members of the two sets, we can see that every member of A is also a member of B, but not every member of B is a member of A: So: A is a subset of B, but B is not a subset of A Proper Subsets If we look at the defintion of subsets and let our mind wander a bit, we come to a weird conclusion. Let A be a set. Is every element of A in A? Well, umm, yes of course, right? So that means that A is a subset of A. It is a subset of itself! This doesn't seem very proper, does it? If we want our subsets to be proper we introduce (what else but) proper subsets: A is a proper subset of B if and only if every element of A is also in B, and there exists at least one element in B that is not in A. This little piece at the end is there to make sure that A is not a proper subset of itself: we say that B must have at least one extra element. {1, 2, 3} is a subset of {1, 2, 3}, but is not a proper subset of {1, 2, 3}. {1, 2, 3} is a proper subset of {1, 2, 3, 4} because the element 4 is not in the first set. Notice that when A is a proper subset of B then it is also a subset of B. Even More Notation When we say that A is a subset of B, we write A B Or we can say that A is not a subset of B by A B When we talk about proper subsets, we take out the line underneath and so it becomes A B or if we want to say the opposite A B Empty (or Null) Set This is probably the weirdest thing about sets. As an example, think of the set of piano keys on a guitar. "But wait!" you say, "There are no piano keys on a guitar!" And right you are. It is a set with no elements. This is known as the Empty Set (or Null Set).There aren't any elements in it. Not one. Zero. It is represented by Or by {} (a set with no elements) Some other examples of the empty set are the set of countries south of the south pole. So what's so weird about the empty set? Well, that part comes next. Empty Set and Subsets So let's go back to our definition of subsets. We have a set A. We won't define it any more than that, it could be any set. Is the empty set a subset of A? Going back to our definition of subsets, if every element in the empty set is also in A, then the empty set is a subset of A. But what if we have no elements? It takes an introduction to logic to understand this, but this statement is one that is "vacuously" or "trivially" true. A good way to think about it is: we can't find any elements in the empty set that aren't in A, so it must be that all elements in the empty set are in A. So the answer to the posed question is a resounding yes. The empty set is a subset of every set, including the empty set itself. Order No, not the order of the elements. In sets it does not matter what order the elements are in. Example: {1,2,3,4} is the same set as {3,1,4,2} When we say order in sets we mean the size of the set. Another (better) name for this is cardinality. A finite set has finite order (or cardinality). An infinite set has infinite order (or cardinality). For finite sets the order (or cardinality) is the number of elements. Example: {10, 20, 30, 40} has an order of 4. For infinite sets, all we can say is that the order is infinite. Oddly enough, we can say with sets that some infinities are larger than others, but this is a more advanced topic in sets. Arg! Not more notation! Nah, just kidding. No more notation. by Ricky Shadrachand Rod Pierce 366, 367, 368, 1051, 1052, 1053, 9070, 2424, 2425, 2426 Copyright 2024 Rod Pierce transitive verb 1 : to cause to sit : place in or on a seat 2 a : to put (a fowl) on eggs to hatch them b : to put (eggs) for hatching under a fowl or into an incubator 3 : to place (oneself) in position to start running in a race 4 a : to place with care or deliberate purpose and with relative stability set a ladder against the wall b : transplant sense 1 d : to put aside (something, such as dough containing yeast) for fermenting 5 : to direct with fixed attention 6 a : to cause to assume a specified condition, relation, or occupation The bird was treated and then set free. They accidentally set the house on fire. b : to cause the start of 7 a : to appoint or assign to an office or duty 8 : to cause to assume a specified posture or position 9 a : to fix as a distinguishing imprint, sign, or appearance the years have set their mark on him c : apply 10 : to fix or decide on as a time, limit, or regulation : prescribe set the rules for the game 11 a : to establish as the highest level or best performance set a record for the half mile b : to furnish as a pattern or model set an example of generosity c : to allot as a task setting lessons for the children to work upon at home Manchester Examiner 12 a : to adjust (a device and especially a measuring device) to a desired position also : to adjust (something, such as a clock) in conformity with a standard b : to restore to normal position or connection when dislocated or fractured c : to spread to the wind 13 a : to put in order for use b : to make scenically ready for a performance 14 a : to put a fine edge on by grinding or honing b : to bend slightly the tooth points of (a saw) alternately in opposite directions c : to sink (the head of a nail) below the surface 15 : to fix in a desired position (as by heating or stretching) 16 : to arrange (hair) in a desired style by using implements (such as curlers, rollers, or clips) and gels or lotions 17 a : to adorn with something affixed or infixed : stud, dot b : to fix (something, such as a precious stone) in a border of metal : place in a setting c : to place in a specified literary or dramatic setting 18 a : to hold something in regard or esteem at the rate of sets a great deal by daily exercise b : to place in a relative rank or category c : to fix at a certain amount d : value, rate their promises were set at naught e : to place as an estimate of worth 19 : to place in relation for comparison or balance theory set against practice 20 b : to incite to attack or antagonism war sets brother against brother 21 a : to place by transporting was set ashore on the island c : to put and fix in a direction set our faces toward home once more d of a dog : to point out the position of (game) by holding a fixed attitude 22 : to defeat (an opponent or a contract) in bridge 23 a : to fix firmly : make immobile : give rigid form or condition to set her jaw in determination b : to make unyielding or obstinate 24 : to cause to become firm or solid 25 : to cause (fruit or seed) to develop intransitive verb 1 2 : to be becoming : be suitable : fit 3 : to cover and warm eggs to hatch them 4 a : to affect one with or as if with weight the pudding sets heavily on my stomach b : to place oneself in position in preparation for an action (such as running) 5 of a plant part : to undergo development usually as a result of pollination 6 a : to pass below the horizon : go down b : to come to an end this century sets with little mirth Thomas Fuller 7 : to apply oneself to some activity 8 : to have a specified direction in motion : flow, tend The wind was setting from Pine Hill to the farm.Esther Forbes 9 of a dog : to indicate the position of game by crouching or pointing 10 : to dance face to face with another in a square dance set to your partner and turn 11 a : to become solid or thickened by chemical or physical alteration b of a dye or color : to become permanent c of a bone : to become whole by growing together

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