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Last updated at Dec. 16, 2024 by Teachoo Next: Question 1 Share on WhatsApp Transcript Shapes Figure Formula Rectangle Area = l b Square Area = a2 Triangle Area = 1/2 Base height Can also be found by Herons formula & Co- ordinate geometry formula Equilateral triangle Area = 3/4 a2 Circle Area = r2 Sector Area = /360 r2 Where = angle in degree Segment Area of segment = Area of sector Area of triangle Parallelogram Area = Base Height Trapezium Area = 1/2 h (a + b) Rhombus Area = 1/2 Diagonal 1 Diagonal 2 Area refers to the amount of space inside a shape or surface. The area of a shape can be determined by placing the shape over the grid and counting the number of squares that itcovers. Various shapes have various formulas to calculate the area, known as area formulas.Area formulas are essential tools used in mathematics to calculate the amount of space enclosed by different two-dimensional shapes. These formulas can be used to find the area of geometric figures such as squares, rectangles, circles, triangles, trapezoids, and ellipses.Given below is the different area formulas chart for various 2d shapes.Area Formulas for various 2d shapesArea is measured in square units. The SI unit to measure the area is m2.Here we will learn about various area formulas for 2d shapes as well as 3d shapes along with their solved examples.Area Formulas of 2D ShapesShapes that have only two dimensions are called 2-D shapes. They are drawn in 2-D space and are dependent on 2 parameters, generally length(l) and breadth(b). The various 2-D shapes are Rectangle, Square, Triangle, Circle, and others.Area of 2D shapes formulas are the formulas that are used to find the area of various 2D shapes, such as the area of a triangle, area of a square, area of a rectangle, area of a rhombus, etc. These area formulas are highly used in mathematics to solve various geometrical problems. Various area formulas for various shapes are,Area Formula of a RectangleIt is a 2-dimensional figure which is a quadrilateral, i.e., it has four sides; its opposite sides are parallel and equal. All the angles in the rectangle are equal and their measure is 90 degrees. The diagonals of the rectangle are equal and they are perpendicular bisectors of each other.The formula for calculating the area of a rectangle is length l and breadth b is,Area of Rectangle (A) = lb square unitsArea Formula of a Squareis a 2-dimensional figure which is a quadrilateral, i.e., it has four sides; its opposite sides are parallel, and all four sides in a square are equal. All the angles in the square are equal and their measure is 90 degrees. The diagonals of the square are equal, and they are perpendicular bisectors of each other.The formula for calculating the area of a square with side a is,Area of Square (A) = a2 sq. unitsArea Formula of a Triangle A triangle is the simplest polygon that is made by joining three straight lines. The sum of the lengths of all sides of the triangle is the perimeter of the triangle, and the space inside the perimeter of the triangle is the area of the triangle.The formula for calculating the area of a triangle with base b and height h is,Area of Triangle (A) = 1/2 bh sq. unitsArea Formula of a CircleCircleis a geometrical figure with no straight lines. It is the locus of the point that is always at a constant distance from the fixed point. The fixed point is called the center of the circle, and the fixed distance is the radius of the circle.The formula for calculating the area of a circle with r as the radius of the circle is,Area of Circle (A) = r2 sq. unitsArea Formula of a ParallelogramA Parallelogram is a 2-D figure in which the opposite sides are parallel and equal. The formula for calculating the area of a parallelogram with base b and height h is,Area of Parallelogram (A) = bh sq. unitsArea Formula of a RhombusA Rhombus is a quadrilateral with all four sides equal and parallel, but not all angles are equal. The formula for calculating the area of a rhombus with diagonals d1 and d2,Area of Rhombus (A) = 1/2 d1 d2 sq. unitsArea Formula of a TrapezoidTrapezoid is another name of trapezium. It is a quadrilateral in which the opposite sides are parallel. The formula for calculating the area of a trapezoid with parallel sides a and b and height h is,Area of Trapezoid (A) = 1/2(a +b)h sq. unitsArea Formula of an EllipseAn Ellipse is a 2-D shape and comes under conic sections. The formula for calculating the area of an ellipse with axes a and b,Area of Ellipse (A) = ab sq. unitsArea Formula of a SemicircleA Semicircle is a 2-D figure that is half of a circle. The formula to calculate the area of a semicircle with radius r is,Area of Semicircle (A) = 1/4(r2) sq. unitsArea Formulas TableThe formulas for the areas of the various 2-D figures are added in the table below.Area of ShapeArea FormulaVariablesArea of a RectangleArea = l bl is the lengthb is the breadthArea of SquareArea = a 2a is the side of the squareArea of TriangleArea = 1/2 bhb is the baseh is the heightArea of CircleArea = r2r is the radius of the circleArea of TrapezoidArea = 1/2 (a+b)ha is the first baseb is the second baseArea of RhombusArea = 1/2 d1 d2d1 is the One Diagonald2 is the Second DiagonalArea of ParallelogramArea = b hb is the baseh is the heightArea of EllipseArea = aba is the radius of major axisb is the radius of minor axisArea of 3D Shapes Formula3-D shapes are the shapes that are drawn in 3-D spaces. They have 3 dimensions that are their parameters. The area of these shapes is dependent on the length, breadth, and height of 3-D shapes. Various 3-D shapes are Cube, Cuboid, Cylinder, Cone, Sphere, and others. The area of 3-D shapes is of two categories that areCurved Surface Area (Lateral Surface Area){CSA}, and Total Surface Area(TSA). The CSA is the area of all the curved surface of the 3-D shapes and TSA is the area of all the faces of the 3-D shapes.Surface Area formula for 3D shapesArea of the 3-D shapes are the space occupied by all the faces of the figure. It is measured in units2. The SI unit of area is m2. The area of cube, area of cuboid, area of cylinder, area of cone, and others a in the area of 3D shapes. The table added below shows the formulas of various 3-D figures. Related Articles:Area and Perimeter FormulasSurface Area FormulasVolume FormulaSolved Examples of Area FormulasExample 1: Find the area of a rectangle with a length of 5 cm and a breadth of 2 cm.Solution:Given,Length of the Rectangle (l) = 5 cmBreadth of the rectangle (b) = 2 cmArea of Rectangle(A) = l bA = 5cm 2cm = 10cm2Example 2: Find the area of the square park whose side is 4 m.Solution:Given,Side of Square (a) = 4 mArea of Square = a2= (4)2 = 16 m2Thus, the area of the square park is 16 m2Example 3: Find the area of a triangular plate whose height is 6 cm and the base is 6 cm.Solution:Given,Height of Triangle (h) = 6 cmBase of Triangle (b) = 8 cmArea of Triangle(A) = 1/2(b h)A = 1/2(8 6)= 48/2 = 24 cm2The area of the triangular plate is 24 cm2Example 4: Find the area of a circular disc with a radius of 1.4 cm.Solution:Given,Radius of Circle (r) = 1.4 cmArea of Circle(A) = r2A = (1.4)2= 22/7(1.4)(1.4) = (4.4)(1.4)= 6.16 cm2The area of the circular disc is 6.16 cm2ConclusionArea formulas allow us to accurately calculate the amount of space enclosed by different geometric figures, such as rectangles, squares, circles, and more complex shapes like cubes and spheres. Mastery of these formulas is essential for solving mathematical problems and is widely utilized in fields such as engineering, architecture, and design. By using these area formulas, one can efficiently determine areas for practical applications, ranging from calculating the space of a room to designing architectural structures. One stop for learning fun!Games, activities, lessons - it's all here!Explore All In this article, we will learn what are the units of area and how to convert one unit to another. But before proceeding to discuss the units, first, we will see what an area is. The best Maths tutors availableWhat is Area? The area can be defined in the following two ways: "The quantity that depicts the extent of two-dimensional shape or figure in the plane is known as area" Or "A space taken by a flat shape or an object is called the area" The concept of the area can also be comprehended by considering small squares of equal sizes. The number of squares that are covered by the shape or its surface is the area of that shape. For example, consider a rectangle that is placed on a grid. Suppose each square in the grid has an area of $1 cm^2$. If 30 squares fit into a closed rectangle on a grid, then we can say that the area of the rectangle is $30 cm^2$. In geometry, we come across different shapes like squares, rectangles, and triangles, etc. All these shapes have different formulas for the calculation of their areas. An area measures the amount of space inside a shape. Knowing how to calculate an area has many useful applications in our daily life. For instance, if you know the area of a wall, then you can calculate the amount of paint needed for the walls. Similarly, if you know the area of the floor of your kitchen, then you can easily compute the number of tiles needed to cover that floor. Surface Area You might have heard the term "surface area". The procedure of calculating the surface area of an object is different from calculating the area of an object. The primary difference between area and surface area is that area is measured for a two-dimensional object or a flat shape. On the other hand, a surface area is measured for 3-dimensional (3D) shapes. A 3D shape can have many 2D shaped faces. Since the surface area depicts the total area covered by the surface of an object, therefore a surface area is an aggregate of the areas of all the faces of the object. For instance, consider a cuboid. The number of rectangular faces in a cuboid is six. Therefore, to measure the surface area of a cuboid, we will add the areas of all the rectangular faces. The units of area and surface area are the same. Now, that we know what an area of an object is, let us proceed to discuss the SI units of area. SI Units of Area The fundamental unit for measuring area under metric system is the square meter. It is equal to the area of a square whose sides measure 1 meter. There are also other units for measuring large and small quantities of an area that are multiples and submultiples of the square meter. The following table shows the comparison between the SI unit of area, i.e. m^2, and other units of area. square kilometer km 1,000,000 m square hectometer hm 10,000 m square decameter dam 100 m square meter m 1 m square decimeter dm 0.01 m square centimeter cm 0.0001 m square millimeter mm 0.000001 m Note that each unit is 100 times larger than the previous. Land Area Measurements The common units to measure the area of land are given below: Hectare The hectare is equivalent to the square hectometer. 1 ha = 1 hm = 10,000 m Are The are is equivalent to the square decameter. 1 a = 1 dam = 100 m Centiare The centiare is equivalent to the square meter. 1 ca = 1 m' Unit Conversion We can convert one unit of the area into another by multiplying or dividing the unit by one followed by as many pairs of zeros as there are places between them. For example, convert $2.5 hm^2$ to m^2. 1 square hectometer = 10,000 square meters 2.5 square hectometers = 2.5 x 10000 = $25000 m^2$ In the next section, we will solve some examples in which we will convert one unit of area into another. Example 1 Convert $35,000 mm^2$ into m^2. Solution Since mm^2 is smaller than m^2, therefore we will be dividing to convert the unit: $1 mm^2 = 0.000001 m^2$ $ 1 m ^2 = \frac{1}{1000000} mm^2$ 35000 square millimeters will be divided by 1000,000 to get the answer in square meters: $35000 mm^2 = \frac{35000}{1000,000} m^2$ = $0.035 m^2$ Example 2 Convert $19 m^2$ into dam^2, Solution m^2 is smaller than dam^2 because $1 dam^2 = 100 m^2$. $1 dam ^2 = 100 m^2$ $19 m^2 = \frac{19}{100} dam^2$ $ = 0.19 dam^2$ Convert $510 cm^2$ to km^2 Solution In this example, first, we will convert cm^2 to m^2, and then m^2 to km^2. $1 cm^2 = 0.0001 m^2$ $510 cm^2 = \frac{510}{10000} m^2$ Remember that instead of dividing the number with one followed by zeroes, you can also multiply the number by 0.0001. The answer will be the same in both cases. = $ 0.051 m^2$ Now we have the amount in m^2, so we will proceed to convert it into the km^2: $1 km ^2 = 1000,000 m^2$ $0.051 m^2 = \frac{0.051}{1000,000} km^2$ = $0.000000051 km^2$ We can write the answer in scientific notation like this: = 5.14 x $10 ^ {-8} km^2$ Example 4 Convert $89 dam^2$ to mm^2. Solution In this example, first, we will convert dam^2 to m^2 and then m^2 to mm^2. Since dam^2 is a bigger unit and m^2 is the smaller unit, therefore we will use the arithmetic operation of multiplication for conversion: $ 1 dam^2 = 100 m^2$ $89 dam^2 = 89 \cdot 100 m^2$ 89 dam will be multiplied by 100 to get the value in meter square: = $8900 m^2$ Now, we have the value in m^2, so we will convert it into mm^2. Again, mm^2 is smaller than m^2, so we will use multiplication here: $ 1m ^2 = 1000,000 mm^2$ $8900 m^2 = 8900 \cdot 1000,000 mm^2$ = $8900,000,000 mm^2$ We can write the answer in scientific notation like this: = 8.9 x $10 ^9 mm^2$ Example 5 Convert $55 hm^2$ to dm^2. Solution In this example, first, we will convert hm^2 to dm^2 and then m^2 to dm^2. Since hm^2 is a bigger unit and m^2 is the smaller unit, therefore we will use the arithmetic operation of multiplication for conversion: $ 1 hm^2 = 10,000 m^2$ $55 hm^2 = 55 \cdot 10,000 m^2$ = $550,000 m^2$ Now, we have the value in m^2, so we will convert it into dm^2. Again, dm^2 is smaller than m^2, so we will use multiplication here: $ 1 m ^2 = 100 dm^2$ $550,000 m^2 = 550,000 \cdot 100 dm^2$ = $550,00000 dm^2$ We can write the answer in scientific notation like this: = 5.5 x $10 ^7 dm^2$ Example 6 According to the law, a building's ground floor area cannot cover more than one-third of the area of the land it is built on. John wants to construct a building on 45- are land. What is the maximum land in meter squares that can be occupied by the ground floor of the building? Solution The area of the land = 45 are The maximum area a ground floor can cover = $\frac{1}{3} \cdot 45 = 15$ Ares Now, we will convert Ares into meter squares. 1 Are = 100 m^2 15 Ares = 1500 m^2 Hence, the maximum area of the ground floor of the building can be 1500 ^m^2$ as per the law. Download Article Download Article There are many different shapes and many reasons why you might want to know their area! Whether you're doing your homework or trying to figure out how much paint you'll need to refurbish that living room, wikiHow has your back! Just get started with Step 1 below to learn how to calculate the area of a shape. 1Measure the width and height. You'll need to start by finding the width and height of the shape (in other words, by finding the measure of two adjoining sides).[1]For a parallelogram, you'll need to use what are called the base and vertical height, but these are the same idea as width and height.In the real world, you'll have to measure for yourself but for your homework your teacher should have these measurements listed with the shape. 2Multiply the sides. Multiply the sides by each other.[2] For example, if you have a rectangle with a height of 16 in and a width of 42 in, you'll need to multiply 16 x 42.[3]If you're calculating the area of a square you can actually save yourself some time when using a calculator and just square the side. So, if the side is 4 ft, click 4 and then the square button on your calculator to get the answer. Squaring automatically multiples the number by itself. Advertisement 3Get your result. The resulting number from the multiplication is the area of your shape, which is written as "square units". So the area for our rectangle would be 672 square inches.This is also sometimes referred to as inches square or written with a small 2 above the text line instead of the word "square". Advertisement 1Take your measurements. You'll need the measurement of the base, the top, and the vertical height. The base and top are the two parallel sides, while the height will be taken on one of the sides with the angle.[4]In the real world, you'll have to measure for yourself but for your homework your teacher should have these measurements listed with the shape.2Add the top and base measurements.[5] Let's say ours has a top that's 5cm and a base that's 7cm. That gives us a value of 12.3Multiply that value by 1/2.[6] That gives us a value of 6.4Multiply that value by the height. For our trapezoid, let's say that that's 6cm. That gives us a value of 36.[7]5Get your result. The resulting number after you multiply the height is the area of the trapezoid. So for our 5x6x7 trapezoid, the area is 36 square cm. Advertisement 1Find the radius. In order to find the area of a circle, you'll need to know the radius. This is the measurement of the distance between the center of the circle and the outside edge. You can also find this by taking the diameter, or the measurement of the width of the circle, and dividing it in half.[8]In the real world, you'll have to measure for yourself but for your homework your teacher should have these measurements listed with the shape.2Square the radius. Multiply the radius times itself. Let's say we have a radius that is 8 feet. That gives us a value of 64.3Multiply by pi. Pi () is a really big number that is used in lots of calculations. If you're using a calculator, use the pi function for a really accurate result. If not, you can round pi (ignore some of the numbers) and just multiply by 3.14159. This gives us a value of 201.06176.[9]4Get your result. The resulting number, 201.06176 in our case, is the area of the circle. So we get a result of 201.06176 square feet. Advertisement 1Take your measurements. Sectors are portions of a circle, that come out looking a bit like fans. You'll need to know the radius of the original circle, or one side of your "fan", as well as the angle of the point. For us, let's say we have a radius of 14 inches and an angle of 60.[10]In the real world, you'll have to measure for yourself but for your homework your teacher should have these measurements listed with the shape.2Square the radius. Multiply the radius times itself. This gives us a value of 196 (14x14).3Multiply by pi. Pi () is a really big number that is used in lots of calculations. If you're using a calculator, use the pi function for a really accurate result. If not, you can round pi (ignore some of the numbers) and just multiply by 3.14159. That gives us a value of 615.75164.[11]4Divide the angle by 360. Now, you'll need to take the angle of the point and divide that number by 360 (which is the number of degrees in a circle). For us, we get a value of roughly .166. It's technically a repeating number, but we're going to round to make the math easier.[12]5Multiply the resulting number by the number you got earlier. Multiply the number you get when you divide by 360 by the number you got earlier after you multiply by pi.[13] For us, this gives a result of about 102.214.6Get your result. This resulting number is the area of your sector, making our sector 102.214 square inches. Advertisement 1Get your measurements. To get the area of an ellipse, you'll need to know the two "radio", which you can think of as the width and the height each divided in half. These are the measurements from the center to the middle of the long side and from the center to the middle of the short side. The measurement lines should form a right angle.In the real world, you'll have to measure for yourself but for your homework your teacher should have these measurements listed with the shape.2Multiply the two radii.[14] For us, let's say that the ellipse is 6 inches wide and 4 inches tall. This gives us radii of 3 inches and 2 inches. Now, we'll multiply those numbers by each other, giving us 6 (3x2).[15]3Multiply that number by pi.[16] Pi () is a really big number that is used in lots of calculations. If you're using a calculator, use the pi function for a really accurate result.[17] If not, you can round pi (ignore some of the numbers) and just multiply by 3.14159. That gives us a value of 18.84954.4Get your result. That resulting number is the area of your ellipse. For us, that means our ellipse is 18.84954 square inches. Advertisement 1Find your measurements. You'll need to know the base measurement of the triangle as well as the height. The base can be any side of the triangle, as long as you can also measure the height. Let's say that we have a triangle with a base of 3 meters and a height of 1 meter.[18]In the real world you'll have to measure for yourself but for your homework your teacher should have these measurements listed with the shape.2Multiply the base by the height. For us, this gives a value of 3 (3x1).[19]3Multiply that value by 1/2.[20] This gives us a value of 1.5.4Get your result. That resulting value is the area of the triangle. So we get a result of 1.5 square meters. Advertisement 1Break the shape down into sections. You'll have to start finding the area for complex shapes by breaking the shape down into geometric shapes, like those discussed above. On homework assignments, it will probably be pretty clear cut what those shapes should be, but in the real world, you might need to break an area up into a lot of shapes in order to get really accurate.[21]A good place to start is by looking for right angles and parallel lines. These serve as the basis of many shapes.2Calculate the area of the separate shapes. Use the instructions above to find the area of the different shapes you find.[22]3Add the shapes together. Add the resulting areas together in order to get the total area for your shape.[23]4Use alternative methods. There are other tricks you can try too, depending on the shape. You can also try adding imaginary space in order to make the shape a standard geometric shape, and then subtracting the area of that imaginary space after you get your result, for example. Advertisement Add New Question Question How can I find the square inches of a triangle with a base of 15 inches and the height of 8 inches? A triangle's area is equal to one-half its base multiplied by its height. A = (15)(8) 2 = 60 sq in. Question A hexagonal prism is 13 cm long and has a volume of 370.5 cm squared. What would be area of the front side? Divide the volume by the length to get the cross-sectional area. Assuming this is a regular hexagon, use the area formula to solve for the width of a side: A = (0.385)(s). Multiply the side width thus calculated by the length of the prism. That gives you the area of one side. Question How can I calculate the area of a parallelogram with a base of 12cm, height of 5 cm, and the inside is 4 cm? The area of a parallelogram is the base multiplied by the height. See more answers Ask a Question Advertisement This article was co-authored by David Jia. David Jia is an Academic Tutor and the Founder of LA Math Tutoring, a private tutoring company based in Los Angeles, California. With over 10 years of teaching experience, David works with students of all ages and grades in various subjects, as well as college admissions counseling and test preparation for the SAT, ACT, ISEE, and more. After attaining a perfect 800 math score and a 690 English score on the SAT, David was awarded the Dickinson Scholarship from the University of Miami, where he graduated with a Bachelors degree in Business Administration. Additionally, David has worked as an instructor for online videos for textbook companies such as Larson Texts, Big Ideas Learning, and Big Ideas Math. This article has been viewed 578,531 times. Co-authors: 32 Updated: November 23, 2024 Views:578,531 Categories: Calculating Volume and Area PrintSend fan mail to authors Thanks to all authors for creating a page that has been read 578,531 times. "Having a diagram with step-by-step calculations to follow was really useful!" Share your story Calculate area by selecting a shape and entering your measurements in any metric or US customary unit. See the formulas to find the area for each shape below. Learn how we calculated this below Add this calculator to your site Cite As: Sexton, J. (n.d.). Area Calculator. Inch Calculator. Retrieved May 29, 2025, from In geometry, area is the space inside the perimeter or boundary of a space, and its symbol is (A). Area is the measurement of the size of a two-dimensional surface, unlike length, which is a unidimensional measurement.Because its two-dimensional, area is measured in square units, for example, square feet or square meters. This indicates that its a measurement of one dimension by another dimension.Area FormulasEvery geometric shape has a unique formula to calculate its area. Use the formulas below to find the area of many popular shapes.Table showing the formula to calculate area for several two-dimensional shapesShapeFormulaSquareA = a2RectangleA = l wTriangleA = bh 2TrapezoidA = 1/2(a + b)hParallelogramA = b hRhombusA = a hKiteA = pq 2CircleA = r2SemicircleA = 1/2r2Circular RingA = R2 r2EllipseA = abSectorA = (360)r2PentagonA = (a2 5) (4 tan(5))HexagonA = (a2 6) (4 tan(6))OctagonA = (a2 8) (4 tan(8))PolygonA = (a2 n) (4 tan(n))Irregular QuadrilateralA = 1/2 d (h1 + h2)How to Find Area of a SquareA square is a polygon (two-dimensional shape) with four equal straight sides and four equal interior right angles.The area of a square is equal to the edge length times the edge length, or the edge length squared.A = a aa = edge lengthHow to Find Area of a RectangleA rectangle is a polygon with four straight sides and four interior right angles. Unlike a square, a rectangles adjacent sides have different lengths, but the opposing sides are equal.The area of a rectangle is equal to the length times the width.A = l wl = lengthw = widthHow to Find Area of a TrapezoidA trapezoid is a polygon with four straight sides, and one pair of sides are parallel.The parallel sides of the trapezoid are called its bases, while the non-parallel sides are called its legs. The perpendicular distance between the bases is called the height or altitude.There are three types of trapezoids: right, isosceles, and scalene. The formula to calculate the area for all three types is one-half of the sum of the base lengths times the distance (height) between them.A = 1/2(a + b)ha = base ab = base bh = heightHow to Find Area of a ParallelogramA parallelogram is similar to a rectangle in that it is a polygon with four straight sides and the adjacent sides are different lengths. However, the opposing sides are equal. Unlike a rectangle, the interior angles are not right angles, and the opposing angles are equal to each other.The area of a parallelogram is equal to the base length times the height.A = b hb = baseh = heightHow to Find Area of a RhombusA rhombus is very similar to a parallelogram, but a rhombus has four sides of equal length. The interior angles of a rhombus are not right angles, but the lines connecting opposing angles intersect at a right angle.The area of a rhombus is equal to the edge length times the height.A = a ha = edge length = heightHow to Find Area of a TriangleA triangle is a polygon with three straight sides and three angles between the sides. There are six types of triangles: right, equilateral, isosceles, scalene, acute, and obtuse.You can find the area of a triangle using several formulas, depending on the information you have about it. The most common formulas are BH, SSS, SAS, SSA, ASA, and AAS.If you know the base and the height of a triangle, you can use the BH formula, which states that the area of a triangle is equal to one-half times the base times the height.A = 1/2bhb = base bh = heightIf you know the length of the three sides, you can use the SSS formula, also known as Herons formula, to find the area.s = 1/2(a + b + c)A = s(s a)(s b)(s c))a = side ab = side bc = side cIf you know the length of two sides and the connecting angle, then you can use the SAS formula to find the area.A = ab 2 sin()a = side ab = side b = angleHow to Find Area of a CircleA circle is a round shape with no corners or edges. Each point along a circle is equidistant from the center. Its important to note that a circle is a two dimensional shape, but it is not a polygon because it does not have straight sides.The area of a circle is equal to times the radius squared.A = r2r = radiusIf you know the circles diameter, you can find the radius by dividing the diameter in half.A = (d/2)2d = diameterHow to Find Area of an EllipseAn ellipse, or oval, is a shape where the sum of the distances from two fixed points, called the foci, is constant. An ellipse has a diameter along the largest dimension, called the semi-major axis, and a smaller diameter, called the semi-minor axis.Its important to note that an ellipse is a two dimensional shape but it is not a polygon because it does not have any straight sides.You can find the area of an ellipse by multiplying times the radius of the semi-major axis times the radius of the semi-minor axis.A = aba = semi-major axis ab = semi-minor axis bHow to Find Area of a SectorA sector is a pie-shaped piece of a circle consisting of an arc connecting a radius on either side. Just like a pie, a circle can be subdivided into various sectors.The area of a sector is equal to the central angle divided by 360, times times the radius squared.A = (360)r2r = radius = angle in degreesHow to Find Area of a SegmentThe segment of a circle is the region between the chord and arc connecting the endpoints of the chord. A chord is a line segment that connects any two points on a circle.The segment would be the portion cut off of a sector if you sliced it at the point where the radius meets the arc on each side.To find the area of a segment, multiply the radius squared by the central angle times , divided by 360, minus the sine of the angle divided by 2.A = (360 sin()2) rr = radius = angle in degreesHow to Find Area of a RingA circular ring, called an annulus, is a ring consisting of an inner circle and an outer circle. The area of the annulus is the space between these two circles.You can find the area of an annulus by subtracting the area of the outer circle from the area of the inner circle. The formula is:A = R2 r2R = larger radiusr = smaller radiusHow to Find Area of a PentagonA pentagon is a regular polygon with five sides that are the same length. Each interior angle is also the same.The area of a pentagon is equal to the side length squared times 5, divided by 4 times the tangent of over 5.A = (a2 5) (4 tan(5))a = edge lengthHow to Find Area of a HexagonA hexagon is a six-sided regular polygon with equal sides and angles.The area of a hexagon is equal to the side length squared times 6, divided by 4 times the tangent of over 6.A = (a2 6) (4 tan(6))a = edge lengthHow to Find Area of an OctagonAn octagon is a regular polygon with eight sides that are the same length and eight interior angles that have equal degree measures.The area of an octagon is equal to the side length squared times 8, divided by 4 times the tangent of over 8.A = (a2 8) (4 tan(8))a = edge lengthHow to Find Area of a Regular PolygonA regular polygon is a shape with straight sides of equal length with interior angles that are also all the same. A square, pentagon, hexagon, and octagon are all examples of regular polygons.The area of a polygon is equal to the side length squared times the number of sides, divided by 4 times the tangent of divided by the number of sides.A = (a2 n) (4 tan(n))a = edge lengthn = number of sidesHow to Find Area of an Irregular QuadrilateralAn irregular quadrilateral is a shape with four sides with different side lengths and different interior angles. The shape is not regular, and the angles that connect each side are not the same.There are a few methods to find the area of an irregular quadrilateral. One way is to connect two opposing angles, then measure the distance of a perpendicular line that connects this line to the remaining two corners.Then the area is equal to one-half of the length of the diagonal, times the sum of the two distances to the remaining corners.A = 1/2 d (h1 + h2)d = diagonalh1 = height 1h2 = height 2How to Find Area of a Compound ShapeA compound shape is a shape that is composed of other shapes and is not a regular polygon, circle, triangle, or quadrilateral.The trick to finding the area of an irregular or complex shape is to break the shape up into regular polygons such as triangles and squares first, then find the area of those simpler shapes first, and then add them together to find the total.Frequently Asked Questions Finding the area of a space is a skill that is frequently used outside of the classroom. For instance, when measuring for landscape mulch, flooring, paint, and even concrete patios, youll need to find the area of the space.You should calculate the area whenever you need to know how large a space is. To measure the area of a space, you need to find the right formula for the shape, then get the measurements needed for each variable in the formula.Measuring the required dimensions of the shape using a ruler or tape measure.Substitute the measurements for the variables in the area formula. You can find the area of a really large space, such as a plot of land or a city, just like you would for a small shape and using the same formulas above. The difference is how you might measure the dimensions and the units used.Large spaces are usually measured in acres, hectares, square miles, or square kilometers.If you already know the dimensions of the space, simply plug them into one of the formulas above and solve. If you dont have the dimensions yet, use a tool like our acreage calculator to measure using a map.After you have the area, you might need to convert it to acres or square miles. For instance, if you have a measurement in square feet, you can convert it to acres by dividing the square feet by 43,560 to get the result. While area is the size of a two-dimensional plane, surface area is the size of the surface of a three-dimensional solid shape. There are a few different types of surface area: curved surface area, lateral surface area, and total surface area.Curved surface area is a measure of the area of the curved regions of an object.Lateral surface area is the area of all of the faces of the object other than the top and bottom bases.Total surface area is the area of the entire object, including the curved surface, faces, and the base. Area and perimeter are related, but the perimeter is the distance around a two-dimensional shape, while area is the size of the shape itself.The perimeter is a length measurement of the boundary around the shape. Imagine you have a rectangle shape; if you took a string and wrapped it around the rectangle, the perimeter would be the length of the string.Of course, we have a perimeter calculator to help solve this length measurement. Area is answered using squared units because we are multiplying a dimension times a dimension (length x width). You can think of it as squared means two and we are multiplying two sides. Calculate area for different shapes like triangle, square, parallelogram, trapezoid, cubic, and circle. Follow the formula and enter the value of the given field, the area of that shape will calculate automatically. *If you liked it then please provide feedback with your experience. And also if you find any glitch or give any suggestions, then also report with us. We will love to hear that both. Area is defined as the total space taken up by a flat (2-D) surface or shape of an object. The space enclosed by the boundary of a plane figure is called its area. The area of a figure is the number of unit squares that cover the surface of a closed figure. Area is measured in square units like cm and m. Area of a shape is a two dimensional quantity. The term area refers to the space inside the boundary or perimeter of a closed shape. The geometry of such a shape contains at least three sides joined together to form a boundary. Symbolic representation of such space in mathematics refers to the area formula. To represent and draw real-life objects, designers and architects use different shapes such as circle, triangle, quadrilateral, and polygon. The invention of the wheel was the prime step of translating objects into geometric shapes. In the early days, the interpretation of area using a formula for geometric shapes evolved from the experiments conducted by Archimedes. We can calculate the area of a shape using a grid. The area of any shape is the number of square units that can fit into it. The grid is made of many squares and each square has sides 1 unit by 1 unit, i.e., the area of each square is 1 square unit. Each square is known as a unit square. Take a pencil and draw a square on a piece of paper. It is a 2-D figure. The space the shape takes up on the paper is called its Area. Now, imagine your square is made up of smaller unit squares. The area of a figure is counted as the number of unit squares required to cover the overall surface area of that particular 2-D shape. Square cms, square feet, square inches, square meters, etc., are some of the common units of area measurement. The easiest method to interpret the area of geometric shapes is using unit squares. A unit square is a square with each of its side length measuring 1 unit. Using this as a basis, the area of a polygon is the number of unit squares within a shape. To find out the area of the square figures drawn below, draw unit squares of 1-centimeter sides. Thus, the shape will be measured in cm^{2}, also known as square centimeters. Here, the area of the shapes below will be measured in square meters (m^{2}) and square inches (in^{2}). The area of a shape is the number of shaded unit squares. In the figure below, the number of shaded unit squares $= 24$. Hence, the area of the shape $= 24$ square units. How to calculate the area if there are also half unit squares in the grid? To understand that, let us take one more example: Step 1: Count the full squares. There are 18 full squares. Step 2: Count the half squares. On counting, we see that there are 6 half squares. Step 3: 1 full square $= 1$ square unit So, 18 full square $= 18$ square units 1 half square $= \frac{1}{2}$ square unit 6 half squares $= 3$ square units Total area $= 18 + 3 = 21$ square units. More Worksheets The term area originated from Latin, meaning a plain piece of empty land. It also means a particular amount of space contained within a set of boundaries. Look at the carpet in your home. To buy a carpet that fits the floor, we need to know its area. Or the carpet will be bigger or smaller than the space! Some other instances when we need to know the area are while fitting tiles on the floor, painting the wall or sticking wallpaper to it, or finding out the total number of tiles needed to build a swimming pool. We are surrounded by so many 2-D shapes: circle, triangle, square, rectangle, parallelogram, and trapezium. You can draw all of these shapes on your paper. Every shape is different and unique, so its area is also calculated differently. To find the area, first, identify the shape. Then, use the appropriate formula from the list given below to find its area. The area of an object can be explained as the amount of material required (such as paper, fabric, tiles) to cover the surface in a 2-dimensional plane. For 3-dimensional planes, such as cuboid, cube, sphere, etc., it is referred to as surface area. Every plane figure cannot be classified as a simple rectangle, square, triangle, or typical shape in real life. Some figures are made up of more than one simple 2-D shape. Let us join a rectangle and a semicircle. These shapes formed by the combination of two or more simple shapes are called composite figures or composite shapes. For finding the area of a composite figure, we must find the sum of the area of all the shapes in it. So, the area of the shape we just drew will be the area of the rectangle, l b plus half the area of the circle, x r, where l and b are the length and breadth of the rectangle and r is the radius of the semicircle. If we draw a semicircle below a triangle, we get the composite shape: The area of such a composite figure will be calculated by adding the area of the triangle and the area of the semicircle. Area of the a composite figure $= (\frac{1}{2} \times b \times h) \times (\frac{1}{2} + \pi r^{2})$ where r is the radius of the semicircle and b and h are the base and height of the triangle respectively. The table below lists the shapes and their formula to calculate area: The table below summarizes some common 2D shapes and the area formula: Area $= 12 \times \text{base} \times \text{heightArea} = 12 \times b \times h$$\text{Area} = \text{length} \times \text{length}\text{Area} = l^{2}$$\text{Area} = \text{length} \times \text{breadthArea} = l \times b$$\text{Area} = \pi \times \text{radius} \times \text{radiusArea} = \pi \times r^{2} (\pi = 3.14)$ AreaPerimeterThe space occupied by a closed plane in a two dimensional shape is called area.Perimeter is the measure of the length of the outer boundary of a closed shape.Area is measured in squared units.Perimeter is measured in units.Example: Area of tiling the floorExample: Perimeter of fencing the garden AreaVolumeArea is defined for 2-dimensional space.Volume is defined for 3-dimensional space.The space occupied by a closed plane in a 2-dimensional shape is called area.The space occupied by a 3-dimensional figure is known as volume.Example: Area of tiling the floorExample: Volume of the room Here are a few ways in which you can apply the knowledge of the area of figures in your daily life. We can find the area of a gifting paper to check whether it will be able to cover a box or not. We can find the area of a square or circle to find the area of the signal board. The concept of area has been the foundation of geometry since the early days. Scientists and astronomers took the help of patterns and geometric shapes to understand and establish advanced concepts in science and mathematics. In a modern aspect, the mathematical modeling of objects such as machines, tools, wheels as well as garment designing uses the concept of area and perimeter. It also serves as a basis for integral calculus to understand complex objects such as spheres and ellipses. 1. The area of the disk was evaluated in the 5th century BCE by Hippocrates of Chios 2. Area of triangle is also calculated using Herons formula So far, we have learned that area is the two-dimensional space any object takes. Learning about shapes and their area and perimeter becomes much more interesting when we understand them with real-life applications. The use of area in practical life is while buying a new house, land, or even a small painting. A circle has a diameter of 20 cm. Find out the area of this circle. Ans: For the circle, $d = 20$ cm. Radius, $r = \frac{d}{2} = 10$ cm Therefore, $A = \pi r^{2}$ $= 3.14 \times 10 \times 10 = 314$ cm^{2} Area of the given circle is 314 cm^{2}. The height of a triangle is 10 cm and the base is 20 cm. What is the area of this triangle? Ans: Area of the triangle $= \frac{1}{2} \times b \times h$ $= \frac{1}{2} \times 20 \times 10 = 100$ cm^{2} Therefore, the area of the given triangle is 100 cm^{2}. The width of a rectangle is half of its length. The width is measured to be 10 cm. What is the area of the rectangle? Ans: For the rectangle, $w = 10 cm$ and$ l = (10 \times 2) = 20$ cm. Area of the rectangle, i.e., $A = l \times w$ $A = 20 \times 10 = 200$ cm^{2} Therefore, the area of the given rectangle is 200 cm^{2}. Example 4: What is the area of the following figure? Solution: Full square $= 1$ square unit So, 14 full square $= 14$ square units 1 half square $= \frac{1}{2}$ square units 5 half squares $= 2.5$ square units Total area $= 14 + 2.5 = 16.5$ square units. Example 5: What is the area of a rectangular park whose length and breadth are 30 m and 50 m respectively? Solution: Given Data: Length of the park $= 30$ m Breadth of the park $= 50$ m Use the area formula. Area of a Rectangle $= \text{Length} \times \text{Breadth}$ $= (30 \times 50)$ m^{2} $= 1500$ m^{2} Example 6: What is the area of a circular cricket stadium whose radius is 200 m? Solution: Given data: Radius of the cricket stadium $= 200$ m Use the area formula. Area of a Circle $= \pi r^{2}$ $= \pi \times 200 m \times 200 m$ $= 40000 \pi$ m^{2} Example 7: What is the area of a square paddy field if each of its sides measures 10 units? Solution: Given data: Length of the side $= 10$ units Use the area formula. Area of the square paddy field $= 10 \times 10$ $= 100$ square units Attend this Quiz & Test your knowledge.

the ideas of calculus. In ancient times, the method of exhaustion was used in a similar way to find the area of the circle, and this method is now recognized as a precursor to integral calculus. Using modern methods, the area of a circle can be computed using a definite integral: A = 2 r r r 2 x 2 d x = r 2 . {\displaystyle A\;=\;2\int _{-r}^{r}{\sqrt {r^{2}-x^{2}}}\,dx\;=\;\pi r^{2}.} Main article: Ellipse AreaThe formula for the area enclosed by an ellipse is related to the formula of a circle; for an ellipse with semi-major and semi-minor axes x and y the formula is:[2] A = x y . {\displaystyle A=\pi xy.} Main article: Surface areaArchimedes showed that the surface area of a sphere is exactly four times the area of a flat disk of the same radius, and the volume enclosed by the sphere is exactly 2/3 of the volume of a cylinder of the same height and radius.Most basic formulas for surface area can be obtained by cutting surfaces and flattening them out (see: developable surfaces). For example, if the side surface of a cylinder (or any prism) is cut lengthwise, the surface can be flattened out into a rectangle. Similarly, if a cut is made along the side of a cone, the side surface can be flattened out into a sector of a circle, and the resulting area computed.The formula for the surface area of a sphere is more difficult to derive: because a sphere has nonzero Gaussian curvature, it cannot be flattened out. The formula for the surface area of a sphere was first obtained by Archimedes in his work On the Sphere and Cylinder. The formula is:[6]A = 4r2 (sphere),where r is the radius of the sphere. As with the formula for the area of a circle, any derivation of this formula inherently uses methods similar to calculus.Triangle area A = b h 2 {\displaystyle A={\tfrac {b\cdot h}{2}}} A triangle: 1 2 B h {\displaystyle {\tfrac {1}{2}}Bh} (where B is any side, and h is the distance from the line on which B lies to the other vertex of the triangle). This formula can be used if the height h is known. If the lengths of the three sides are known then Heron's formula can be used: s (s a) (s b) (s c) {\displaystyle {\sqrt {s(s-a)(s-b)(s-c)}}} where a, b, c are the sides of the triangle, and s = 1 2 (a + b + c) {\displaystyle s={\tfrac {1}{2}}(a+b+c)} is half of its perimeter.[2] If an angle and its two included sides are given, the area is 1 2 a b sin (C) {\displaystyle {\tfrac {1}{2}}ab\sin(C)} where C is the given angle and a and b are its included sides.[2] If the triangle is graphed on a coordinate plane, a matrix can be used and is simplified to the absolute value of 1 2 (x 1 y 2 + x 2 y 3 + x 3 y 1 x 2 y 1 x 3 y 2 x 1 y 3) {\displaystyle {\tfrac {1}{2}}(x_{1}y_{2}+x_{2}y_{3}+x_{3}y_{1}-x_{2}y_{1}-x_{3}y_{2}-x_{1}y_{3})} . This formula is also known as the shoelace formula and is an easy way to solve for the area of a coordinate triangle by substituting the 3 points (x1,y1), (x2,y2), and (x3,y3). The shoelace formula can also be used to find the areas of other polygons when their vertices are known. Another approach for a coordinate triangle is to use calculus to find the area.A simple polygon constructed on a grid of equal-distanced points (i.e., points with integer coordinates) such that all the polygon's vertices are grid points: i + b 2 1 {\displaystyle i+{\frac {b}{2}}-1} , where i is the number of grid points inside the polygon and b is the number of boundary points. This result is known as Pick's theorem.[29]Integration can be thought of as measuring the area under a curve, defined by f(x), between two points (here a and b).The area between two graphs can be evaluated by calculating the difference between the integrals of the two functionsThe area between a positive-valued curve and the horizontal axis, measured between two values a and b (b is defined as the larger of the two values) on the horizontal axis, is given by the integral from a to b of the function that represents the curve:[1] A = a b f (x) d x . {\displaystyle A=\int _{a}^{b}f(x)\,dx.} The area between the graphs of two functions is equal to the integral of one function, f(x), minus the integral of the other function, g(x): A = a b (f (x) g (x)) d x , {\displaystyle A=\int _{a}^{b}(f(x)-g(x))\,dx,} where f (x) {\displaystyle f(x)} is the curve with the greater y-value.An area bounded by a function r = r ( ) {\displaystyle r=r\theta)} expressed in polar coordinates is:[1] A = 1 2 r 2 d . {\displaystyle A={1 \over 2}\int r^{2}\,d\theta .} The area enclosed by a parametric curve u (t) = (x (t) , y (t)) {\displaystyle {\vec {u}}(t)=(x(t),y(t))} with endpoints u (t 0) = u (t 1) {\displaystyle {\vec {u}}(t_{0})={\vec {u}}(t_{1}))} is given by the line integrals: t 0 t 1 x y d t = t 0 t 1 y x d t = 1 2 t 0 t 1 (x y y x) d t {\displaystyle \oint _{t_{0}}^{t_{1}}x{\dot {y}}\,dt=-\oint _{t_{0}}^{t_{1}}y{\dot {x}}\,dt={1 \over 2}\oint _{t_{0}}^{t_{1}}(x{\dot {y}}-y{\dot {x}})\,dt} or the z-component of 1 2 t 0 t 1 u u d t . {\displaystyle {1 \over 2}\oint _{t_{0}}^{t_{1}}{\vec {u}}\times {\dot {\vec {u}}}\,dt.} (For details, see Green's theorem Area calculation.) This is the principle of the planimeter mechanical device.To find the bounded area between two quadratic functions, we first subtract one from the other, writing the difference as f (x) g (x) = a x 2 + b x + c = a (x) (x) {\displaystyle f(x)-g(x)=ax^{2}+bx+c=a(x-\alpha)(x-\beta)} where f(x) is the quadratic upper bound and g(x) is the quadratic lower bound. By the area integral formulas above and Vieta's formula, we can obtain that[30][31] A = (b 2 4 a c) 3 / 2 6 a 2 = a 6 ( ) 3 , a 0. {\displaystyle A={\frac {(b^{2}-4ac)^{3/2}}{6a^{2}}}={\frac {a}{6}}(\beta -\alpha)^{3},\qquad aeq 0.} The above remains valid if one of the bounding functions is linear instead of quadratic.Cone:[32] r (r + r 2 + h 2) {\displaystyle \pi r\left(r+{\sqrt {r^{2}+h^{2}}}\right)} , where r is the radius of the circular base, and h is the height. That can also be rewritten as r 2 + r l {\displaystyle \pi r^{2}+\pi rl} [32] or r (r + l) {\displaystyle \pi r(r+l)\,\!} where r is the radius and l is the slant height of the cone. r 2 {\displaystyle \pi r^{2}} is the base area while r l {\displaystyle \pi rl} is the lateral surface area of the cone.[32]Cube: 6 s 2 {\displaystyle 6s^{2}} , where s is the length of an edge.[6]Cylinder: 2 r (r + h) {\displaystyle 2\pi r(r+h)} , where r is the radius of a base and h is the height. The 2 r {\displaystyle 2\pi r} can also be rewritten as d {\displaystyle \pi d} , where d is the diameter.Prism: 2 B + P h {\displaystyle 2B+Ph} , where B is the area of a base, P is the perimeter of a base, and h is the height of the prism.pyramid: B + P L 2 {\displaystyle B+{\frac {PL}{2}}} , where B is the area of the base, P is the perimeter of the base, and L is the length of the slant.Rectangular prism: 2 (w + h + w h) {\displaystyle 2(\ell w+\ell h+wh)} , where {\displaystyle \ell } is the length, w is the width, and h is the height.The general formula for the surface area of the graph of a continuously differentiable function z = f (x , y) , {\displaystyle z=f(x,y),} where (x , y) D R 2 {\displaystyle (x,y)\in D\subset \mathbb {R} ^{2}} and D {\displaystyle D} is a region in the xy-plane with the smooth boundary: A = D (f x) 2 + (f y) 2 + 1 d x d y . {\displaystyle A=\iint _{D}{\sqrt {\left({\frac {\partial f}{\partial x}}\right)^{2}+\left({\frac {\partial f}{\partial y}}\right)^{2}+1}}\,dx\,dy.} An even more general formula for the area of the graph of a parametric surface in the vector form r = r (u , v) , {\displaystyle \mathbf {r} =\mathbf {r} (u,v),} where r {\displaystyle \mathbf {r} } is a continuously differentiable vector function of (u , v) D R 2 {\displaystyle (u,v)\in D\subset \mathbb {R} ^{2}} is:[8] A = D | r u r v | d u d v . {\displaystyle A=\iint _{D}\left|{\frac {\partial \mathbf {r} }{\partial u}}\times {\frac {\partial \mathbf {r} }{\partial v}}\right|\,du\,dv.} Additional common formulas for area:ShapeFormulaVariablesSquare A = s 2 {\displaystyle A=s^{2}} Rectangle A = a b {\displaystyle A=ab} Triangle A = 1 2 b h {\displaystyle A={\frac {1}{2}}bh\,\!} Triangle A = 1 2 a b sin ( ) {\displaystyle A={\frac {1}{2}}ab\sin(\gamma)\,\!} Triangle(Heron's formula) A = s (s a) (s b) (s c) {\displaystyle A={\sqrt {s(s-a)(s-b)(s-c)}}\,\!} s = 1 2 (a + b + c) {\displaystyle s={\tfrac {1}{2}}(a+b+c)} Isosceles triangle A = c 4 4 a 2 c 2 {\displaystyle A={\frac {c}{4}}{\sqrt {4a^{2}-c^{2}}}} Regular triangle(equilateral triangle) A = 3 4 a 2 {\displaystyle A={\frac {\sqrt {3}}{4}a^{2}\,\!} Rhombus/Kite A = 1 2 d e {\displaystyle A={\frac {1}{2}}de} Parallelogram A = a h a {\displaystyle A=ah_{a}\,\!} Trapezoid A = (a + c) h 2 {\displaystyle A={\frac {(a+c)h}{2}}\,\!} Regular hexagon A = 3 2 3 a 2 {\displaystyle A={\frac {3}{2}}{\sqrt {3}}a^{2}\,\!} Regular octagon A = 2 (1 + 2) a 2 {\displaystyle A=2(1+{\sqrt {2}})a^{2}\,\!} Regular polygon(n {\displaystyle n} sides) A = n a r 2 = p r 2 {\displaystyle A=n{\frac {ar}{2}}={\frac {pr}{2}}} = 1 4 n a 2 cot (n) {\displaystyle \quad ={\tfrac {1}{4}}na^{2}\cot({\tfrac {\pi }{n}})} = n r 2 tan (n) {\displaystyle \quad =nr^{2}\tan({\tfrac {\pi }{n}})} = 1 4 n p 2 cot (n) {\displaystyle \quad ={\tfrac {1}{4n}}p^{2}\cot({\tfrac {\pi }{n}})} = 1 2 n R 2 sin (2 n) {\displaystyle \quad ={\tfrac {1}{2}}nR^{2}\sin({\tfrac {2\pi }{n}})\,\!} p = n a {\displaystyle p=na\ } (perimeter) r = a 2 cot (n) , {\displaystyle r={\tfrac {a}{2}}\cot({\tfrac {\pi }{n}}),} a 2 = r tan (n) = R sin (n) {\displaystyle {\tfrac {a}{2}}=r\tan({\tfrac {\pi }{n}})=R\sin({\tfrac {\pi }{n}})} r : {\displaystyle r:} incircle radius R : {\displaystyle R:} circumcircle radiusCircle A = r 2 = d 2 4 {\displaystyle A=\pi r^{2}={\frac {\pi d^{2}}{4}}} (d = 2 r : {\displaystyle d=2r:} diameter)Circular sector A = 2 r 2 = L r 2 {\displaystyle A={\frac {\theta }{2}}r^{2}={\frac {L\cdot r}{2}}\,\!} Ellipse A = a b {\displaystyle A=\pi ab\,\!} Integral A = a b f (x) d x , f (x) 0 {\displaystyle A=\int _{a}^{b}f(x)\mathrm {d} x,\ f(x)\geq 0} Surface areaSphere A = 4 r 2 = d 2 {\displaystyle A=4\pi r^{2}=\pi d^{2}} Cuboid A = 2 (a b + a c + b c) {\displaystyle A=2(ab+ac+bc)} Cylinder(incl. bottom and top) A = 2 r (r + h) {\displaystyle A=2\pi r(r+h)} Cone(incl. bottom) A = r (r + r 2 + h 2) {\displaystyle A=\pi r(r+{\sqrt {r^{2}+h^{2}}})} Torus A = 4 2 R r {\displaystyle A=4\pi ^{2}\cdot R\cdot r} Surface of revolution A = 2 a b f (x) 1 + [f (x)] 2 d x {\displaystyle A=2\pi \int _{a}^{b}\!f(x){\sqrt {1+\left[f'(x)\right]^{2}}}\mathrm {d} x} (rotation around the x-axis)The above calculations show how to find the areas of many common shapes.The areas of irregular (and thus arbitrary) polygons can be calculated using the "Surveyor's formula" (shoelace formula).[28]The isoperimetric inequality states that, for a closed curve of length L (so the region it encloses has perimeter L) and for area A of the region that it encloses, 4 A L 2 , {\displaystyle 4\pi A\leq L^{2},} and equality holds if and only if the curve is a circle. Thus a circle has the largest area of any closed figure with a given perimeter.At the other extreme, a figure with given perimeter L could have an arbitrarily small area, as illustrated by a rhombus that is "tipped over" arbitrarily far so that two of its angles are arbitrarily close to 0 and the other two are arbitrarily close to 180.For a circle, the ratio of the area to the circumference (the term for the perimeter of a circle) equals half the radius r. This can be seen from the area formula r2 and the circumference formula 2r.The area of a regular polygon is half its perimeter times the apothem (where the apothem is the distance from the center to the nearest point on any side).Doubling the edge lengths of a polygon multiplies its area by four, which is two (the ratio of the new to the old side length) raised to the power of two (the dimension of the space the polygon resides in). But if the one-dimensional lengths of a fractal drawn in two dimensions are all doubled, the spatial content of the fractal scales by a power of two that is not necessarily an integer. This power is called the fractal dimension of the fractal.[33]Main article: Bisection Area bisectors and perimeter bisectorsThere are an infinitude of lines that bisect the area of a triangle. Three of them are the medians of the triangle (which connect the sides' midpoints with the opposite vertices), and these are concurrent at the triangle's centroid; indeed, they are the only area bisectors that go through the centroid. Any line through a triangle that splits both the triangle's area and its perimeter in half goes through the triangle's incenter (the center of its incircle). There are either one, two, or three of these for any given triangle.Any line through the midpoint of a parallelogram bisects the area.All area bisectors of a circle or other ellipse go through the center, and any chords through the center bisect the area. In the case of a circle they are the diameters of the circle.Given a wire contour, the surface of least area spanning ("filling") it is a minimal surface. Familiar examples include soap bubbles.The question of the filling area of the Riemannian circle remains open.[34]The circle has the largest area of any two-dimensional object having the same perimeter.A cyclic polygon (one inscribed in a circle) has the largest area of any polygon with a given number of sides of the same lengths.A version of the isoperimetric inequality for triangles states that the triangle of greatest area among all those with a given perimeter is equilateral.[35]The triangle of largest area of all those inscribed in a given circle is equilateral; and the triangle of smallest area of all those circumscribed around a given circle is equilateral.[36]The ratio of the area of the incircle to the area of an equilateral triangle, 3 3 {\displaystyle {\frac {\pi }{3{\sqrt {3}}}}} , is larger than that of any non-equilateral triangle.[37]The ratio of the area to the square of the perimeter of an equilateral triangle, 1 12 3 , {\displaystyle {\frac {1}{12{\sqrt {3}}}},} is larger than that for any other triangle.[35]Brahmagupta quadrilateral, a cyclic quadrilateral with integer sides, integer diagonals, and integer area.Equiareal mapHeronian triangle, a triangle with integer sides and integer area.List of triangle inequalitiesOne-seventh area triangle, an inner triangle with one-seventh the area of the reference triangle.Routh's theorem, a generalization of the one-seventh area triangle.Orders of magnitudeA list of areas by size.Derivation of the formula of a pentagonPlanimeter, an instrument for measuring small areas, e.g. on maps.Area of a convex quadrilateralBoshpis pentagon, a cyclic pentagon whose side lengths and area are all rational numbers.^ a b c d e f Weisstein, Eric W. "Area". Wolfram MathWorld. Archived from the original on 5 May 2012. Retrieved 3 July 2012.^ a b c d e f g h i "Area Formulas". Math.com. Archived from the original on 2 July 2012. Retrieved 2 July 2012.^ a b "Resolution 12 of the 11th meeting of the CGPM (1960)". Bureau International des Poids et Mesures. Archived from the original on 2012-07-28. Retrieved 15 July 2012.^ Mark de Berg; Marc van Kreveld; Mark Overmars; Otfried Schwarzkopf (2000). "Chapter 3: Polygon Triangulation". Computational Geometry (2nd revisended.). Springer-Verlag. pp.4561. ISBN978-3-540-65620-3.^ Boyer, Carl B. (1959). A History of the Calculus and Its Conceptual Development. Dover.^ a b c Weisstein, Eric W. "Surface Area". Wolfram MathWorld. Archived from the original on 23 June 2012. Retrieved 3 July 2012.^ "Surface Area". CK-12 Foundation. Retrieved 2018-10-09.^ a b do Carmo, Manfredo (1976). Differential Geometry of Curves and Surfaces. Prentice-Hall. p. 98, ISBN978-0-13-212589-5^ Walter Rudin (1966). Real and Complex Analysis, McGraw-Hill, ISBN0-07-100276-6.^ Gerald Folland (1999). Real Analysis: modern techniques and their applications, John Wiley & Sons, Inc., p. 20, ISBN0-471-31716-0^ Apostol, Tom (1967). Calculus. Vol.I: One-Variable Calculus, with an Introduction to Linear Algebra. John Wiley & Sons. pp.5859. ISBN9780471000051.^ Moise, Edwin (1963). Elementary Geometry from an Advanced Standpoint. Addison-Wesley Pub. Co. Retrieved 15 July 2012.^ a b c d Bureau international des poids et mesures (2006). The International System of Units (SI) (PDF). 8th ed. Chapter 5. Archived (PDF) from the original on 2013-11-05. Retrieved 2008-02-13.^ "Land Measurement Units in India: Standard Measurement Units, Land Conversion Table". Magicbricks Blog. 2020-08-04. Retrieved 2023-09-20.^ Mishra, Sunita (2023-06-13). "Land is measured in what units in India: All Types In 2023". Housing News. Retrieved 2023-09-20.^ "Standard Land Measurement Units in India - Times Property". timesproperty.com. Retrieved 2023-09-20.^ www.clicbrics.com. "9 Land Measurement Units in India You Must Know - 2022". www.clicbrics.com. Retrieved 2023-09-20.^ Heath, Thomas L. (2003). A Manual of Greek Mathematics. Courier Dover Publications. pp.121132. ISBN978-0-486-43231-1. Archived from the original on 2016-05-01.^ Stewart, James (2003). Single variable calculus early transcendentals (5th.ed.). Toronto ON: Brook/Cole. p.3. ISBN978-0-534-39330-4. However, by indirect reasoning, Eudoxus (fifth century B.C.) used exhaustion to prove the familiar formula for the area of a circle: A = r 2 . {\displaystyle A=\pi r^{2}.} ^ Heath, Thomas L. (1921). A History of Greek Mathematics (Vol II). Oxford University Press. pp.321323.^ Weisstein, Eric W. "Heron's Formula". MathWorld.^ "Euclid's Proof of the Pythagorean Theorem | Synaptic". Central College. Retrieved 2023-07-12.^ Clark, Walter Eugene (1930). The Aryabhatiya of Aryabhata: An Ancient Indian Work on Mathematics and Astronomy (PDF). University of Chicago Press. p.26.^ Xu, Wenwen; Yu, Ning (May 2013). "Bridge Named After the Mathematician Who Discovered the Chinese Remainder Theorem" (PDF). Notices of the American Mathematical Society. 60 (5): 596597. doi:10.1090/noti993.^ Bourke, Paul (July 1988). "Calculating The Area And Centroid Of A Polygon" (PDF). Archived (PDF) from the original on 2012-09-16. Retrieved 6 Feb 2013.^ Averbach, Bonnie; Chein, Orin (2012). Problem Solving Through Recreational Mathematics. Dover. p.306. ISBN978-0-486-13174-0.^ Joshi, K. D. (2002). Calculus for Scientists and Engineers: An Analytical Approach. CRC Press. p.43. ISBN978-0-8493-1319-6. Archived from the original on 2016-05-05.^ a b Braden, Bart (September 1986). "The Surveyor's Area Formula" (PDF). The College Mathematics Journal. 17 (4): 326337. doi:10.2307/2686282. JSTOR2686282. Archived (PDF) from the original on 27 June 2012. Retrieved 15 July 2012.^ Trainin, J. (November 2007). "An elementary proof of Pick's theorem". Mathematical Gazette. 91 (522): 536540. doi:10.1017/S0025557200182270. S2CID124831432.^ Matematika. PT Grafindo Media Pratama. pp.51. ISBN978-979-758-477-1. Archived from the original on 2017-03-20.^ Get Success UN +SPMB Matematika. PT Grafindo Media Pratama. pp.157. ISBN978-602-00-0090-9. Archived from the original on 2016-12-23.^ a b c Weisstein, Eric W. "Cone". Wolfram MathWorld. Archived from the original on 21 June 2012. Retrieved 6 July 2012.^ Mandelbrot, Benot B. (1983). The fractal geometry of nature. Macmillan. ISBN978-0-7167-1186-5. Archived from the original on 20 March 2017. Retrieved 1 February 2012.^ Gromov, Mikhael (1983). "Filling Riemannian manifolds". Journal of Differential Geometry. 18 (1): 1147. CiteSeerX10.1.1.400.9154. doi:10.4310/jdg/1214509283. MR0697984. Archived from the original on 2014-04-08.^ a b Chakerian, G.D. (1979) "A Distorted View of Geometry." Ch. 7 in Mathematical Plums. R. Honsberger (ed.). Washington, DC: Mathematical Association of America, p. 147.^ Dorrie, Heinrich (1965), 100 Great Problems of Elementary Mathematics, Dover Publ., pp. 379380.^ Minda, D.; Phelps, S. (October 2008). "Triangles, ellipses, and cubic polynomials". American Mathematical Monthly. 115 (8): 679689: Theorem 4.1. doi:10.1080/00029890.2008.11920581. JSTOR27642581. S2CID15049234. Archived from the original on 2016-11-04.Area at Wikipedia's sister projectsDefinitions from WiktionaryMedia from CommonsData from WikidataRetrieved from " responsible tutor! Provide a lot of feedback as well. Shoshana brings with her a very strong connection with her students. My kids looked forward to her class and always had a good comments about her class. Shoshana next best asset is her patience, she can talk to my kids until they understand the topics. Good to have her as our kids tutor. Ronke is an excellent tutor. She made me feel at home and explained every detail of the dress making. She taught me, that in the first hour I knew this is the best tutor for me. I really recommend her. As a tutor myself looking to upgrade, she taught me well. She's there for you as a beginner or a tutor trying to upgrade her sewing skills.Absolutely great teacher, Im started learning with Marie as an adult learner and Ive developed so much over the course of 6 months so far. I continue to enjoy learning with her. She is patient, well versed and professional, would highly recommend. Shria has been tutoring my daughter for a few months, she has a real gift for explaining concepts and teaching. She ensures concepts are understood before moving on, and provides opportunities to challenge. She is engaging, calm, kind and extremely passionate about her work. I feel she is an absolute gem, highly knowledgeable and we are looking forward completing our academic journey with her. Thank you for everything so far!Athina is an amazing teacher and she makes you feel extremely comfortable throughout the session, going into the session I was so anxious and I came out with more confidence. She will talk you through each task and will even do it with you so that you feel comfortable. I would 100% recommend her

How to find the area of all shapes. How to find the area of two different shapes. How to find surface area of different shapes. How to find area and perimeter of different shapes. How to find the area of different 3d shapes.