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What are the formulas for shapes

Capsule Calculator Volume = πr2((4/3)r + a) Surface Area = 2πr(2r + a) Circumference = 2πr Also called a stadium of revolution. The first recorded use of areas was in ancient Babylon, where they used it to measure the amount of land that was owned by different populations for taxation purposes. Later in 287 BC, the great mathematician Archimedes from Greece discovered the area and the perimeter of the circle and the relationship between spheres. Archimedes, no doubt, wasn't the first to realize the fact. However, he was, as far as we know, the first to prove it formally. He also gave the earliest proofs for the volume of the sphere and surface area.Definition of AreaIn geometry, the area can be defined as the space occupied by the surface of an object or any flat shape. The area of an object is the number of unit squares that cover the surface of a closed object. The area is measured in square units such as square feet, square centimeters, square inches, etc.The origin of the word is from ‘area’ in Latin, which translates to a vacant piece of level ground. This further led to a derivation of the area as a particular amount of space contained within a set of boundaries.To determine the size of the carpet to be bought, we often find the area of the room floor.To cover the floor with tiles, to cover the wall with paint or wallpaper or to build a swimming pool are other examples, where the area is computed.In reality, not every plane surface can be clearly classified as a rectangle, square or a triangle. For finding the area of a composite figure that contains more than one shape, we will find the sum of the area of all the shapes forming the composite figure.The area of the outside surface of a three-dimensional shape or a solid is called Surface Area of that surface. For example, a rectangular prism has 6 rectangular bases and lateral faces. Thus, the total surface area is equal to the sum of the areas of all 6 rectangles.Area FormulasIn general, we can say that the area of shapes can be defined as the quantity of paint required to cover the surface with a single coat. These are the following ways to calculate the area based on the number of sides that exist in the shape, as illustrated below in fig. (Images will be uploaded soon)What are 3D Shapes?The three-dimensional shapes, also known as solid shapes, are those which have three dimensions such as length, breadth and thickness. The two different measures which are used to define the three-dimensional shapes are surface area and volume. In general, the 3D shapes are obtained from the rotation of two-dimensional shapes. Thus, the surface area of any two-dimensional shapes should be a 2D shape. If we want to calculate the surface area of any solid shape, we can easily calculate it from the area of 2D shapes.Area of 3D Shapes FormulaAccording to the International System of Units (SI), the standard unit of area is the square meter (written as m2) and it is also the area of a square whose sides are one meter long. For example, a definite shape with an area of three square meters would have the same area as three such squares. The surface area of any solid object is a measure of the total area which the surface of the object occupies.For 3D/ solid shapes like cuboid, cube, cylinder, sphere and cone, the area is updated to the concept of the surface area of the shapes. The formulas for 3D shapes are given in the table below:Area Formula for Different ShapesShapeAreaTermsCircleπ × r2r = radius of the circleTriangle½ × b × hb = baseh = heightSquarea2a = length of sideRectanglel × wl = lengthw = widthParallelogramb × hb = baseh = vertical heightTrapezium½(a + b) × ha & b are length of parallel sidesh = heightEllipseπaba = ½ minor axisb = ½ major axisFormulas for 3D ShapesShapeSurface AreaTermsCube6a2a = length of the edgeRectangular prism2(wl + hl + hw)l = lengthw = widthh = heightCylinder2πr(r + h)r = radius of the circular baseh = height of the cylinderConeπr(r + l)r = radius of the circular basel = slant heightSphere4πr2r = radius of the sphereHemisphere3πr2r = radius of the hemisphereKnow More about Area The area is defined as a two-dimensional space that is taken up by an object. The concept of the area has a lot of real-life applications. For example; the area is used in farming, building, plotting lands, science and so much more like painting the walls of your room or buying new furniture for the house. The area can be determined with basic calculations and understanding. The number of square units inside a figure is used to find out the area for a square or rectangle. Sometimes, in the cases of polygons, one can find out the area by multiplying the length by the width.To find out the area of a Square,A=s2 where s is the length of the sides of the square. To find out the area of a Rectangle A=LW, where L and W are the lengths of the rectangle's sides (length and width).To find out the area of a triangleA=12bh, where b and h are the base and height.To find out the area of a Parallelogram A=bh, where b is the length of the base and h is the height.To find out the area of a CircleA=πr2, where r is the radius The geometry formulas are used for finding dimensions, perimeter, area, surface area, volume, etc. of the geometric shapes. Geometry is a part of mathematics that deals with the relationships of points, lines, angles, surfaces, solids measurement, and properties. There are two types of geometry: 2D or plane geometry and 3D or solid geometry. 2D shapes are flat shapes that have only two dimensions, length, and width as in squares, circles, and triangles, etc. 3D objects are solid objects, that have three dimensions, length, width, and height or depth, as in a cube, cuboid, sphere, cylinder, cone, Let us learn geometry formulas along with a few solved examples in the upcoming sections. What Are Geometry Formulas? The formulas used for finding dimensions, perimeter, area, surface area, volume, etc. of 2D and 3D geometric shapes are known as geometry formulas. 2D shapes consist of flat shapes like squares, circles, and triangles, etc., and cube, cuboid, sphere, cylinder, cone, etc are some examples of 3D shapes. The basic geometry formulas are given as: List of Geometry Formulas Below is the list of various geometry formulas for you according to the geometric shape. Basic geometry formulas where the mathematical constant π is used are, where, r = Radius; h = Height. and, l = Slant height The formula table depicts the geometry formulas used for different 2-D and 3-D shapes: SHAPES FORMULAS 1. Right Triangle Pythagoras Theorem: a2 + b2 = c2 Area = ½ ab Perimeter = a + b + √(a2 + b2) Where, c = hypotenuse of a triangle a = altitude of a triangle b = base of a triangle 2. Triangle Perimeter, P = a + b + c Area, A = ½ bh Height, h = 2(A/b) Where, a,b,c are the sides of a triangle. 3. Rectangle Perimeter = 2(l + w) Area = lw Diagonal, d = √(l2 + w2) Where, l = length of a rectangle w = width of a rectangle 4.Parallelogram Perimeter, P = 2(a + b) Area, A = bh Height, h = A/b Base, b = A/h Where, a and b are the sides of a parallelogram h = height of a parallelogram 5. Trapezium Area, A = ½(a + b)h Height, h = 2A/(a + b) Base, b = 2(A/h) – a Where, a and b are the parallel sides h = distance between two parallel sides 6. Circle Circumference = 2πr Area = πr2 Diameter = 2r Where, r = radius of a circle 7. Square Perimeter, P = 4a Area, A = a2 Diagonal, d = a√2 Side, a = √A = d/2√2 Where, a = side of a square 8. Arc Arc Length, L = rθ Area, A = ½r2θ Here, θ is the central angle is radians. Where, r = radius 9. Cube Area, A = 6a2 Volume, V = a3 Edge, a = V⅓ Space diagonal = a√3 Where, a = side of a cube 10. Cuboid Surface Area, A = 2(lb + bh + hl) Volume, V = lbh Space diagonal, d = √(l2 + b2 +h2) Where, l= length b= breath h= height 11. Cylinder Total Surface Area, A = 2πrh + 2πr2 Curved Surface Area, Ac = 2πrh Volume, V = πr2h Base Area, Ab = πr2 Radius, r = √(V/πh) Where, r= radius of a cylinder h= height of a cylinder 12. Cone Total Surface Area, A = πr(r+l) = πr[r+√(h2+r2)] Curved Surface Area, Ac = πrl Volume, V = ⅓πr2h Slant Height, l = √(h2+r2) Base Area, Ab = πr2 Where, r= radius of a cone h= height of a cone l = slant height 13. Sphere Surface Area, A = 4πr2 Volume, V = ⅔πr3 Diameter = 2r Where, r= radius of a sphere Great learning in high school using simple cues Indulging in rote learning, you are likely to forget concepts. With Cuemath, you will learn visually and be surprised by the outcomes. Book a Free Trial Class Let's have a look at solved examples to understand geometry Formulas better. Solved Examples Using Geometry Formulas Example 1: Calculate the circumference and the area and of a circle by using geometry formulas if the radius of the circle is 21 units? Solution: To find the area and the circumference of the circle: Given: Radius of a circle = 21 units Using geometry formulas for circle, Area of circle = π×r2 = 3.142857 × 212 = 1385.44 Now for the circumference of the circle, Using geometry formulas for circle, Circumference of a Circle = 2πr = 2(3.142857)(21) = 131.95 Answer: The area of a circle is 1385.44 sq. units and the circumference of a circle is 131.95 units. Example 2: What is the area of a rectangular park whose length and breadth are 60m and 90m respectively? Solution: To find the area of a rectangular park: Given: Length of the park = 60m The breadth of the park = 90m Using geometry formulas for rectangle, Area of Rectangle = (Length × Breadth) = (60 × 90) m2 = 5400 m2 Answer: The area of the rectangular park is 5400 m2. Example 3: Using geometry formulas of the cube, calculate the surface area and volume of a cube whose edge is 6 units respectively? Solution: To Find: The surface area and volume of a cube whose edge is 6 units Using geometry formulas of cube, Surface area of cube is = A = 6a2 A = 6 (6)2 A = 6 × 36 = 216 units2 Volume of a cube, V = a3 V = (6)3 V = 216 units3 Answer: The surface area of the cube is 216 units2. The volume of the cube is 216 units3 The geometry formulas of a cuboid are listed below: Where, l= length b= breadth h= height What Are the Geometry Formulas of a Rectangle? The geometry formulas of a rectangle are listed below: Perimeter of a rectangle = 2(l + w) Area of rectangle = lw Diagonal of a rectangle, d = √(l2 + w2) Where, l = length of a rectangle w = width of a rectangle What Are the Geometry Formulas of a Cone? The geometry formulas of a cone are listed below: Total surface area of cone, A = πr(r+l) = πr[r+√(h2+r2)] Curved surface area of cone, Ac = πrl Volume of cone, V = ⅓πr2h Slant Height of cone, l = √(h2+r2) Base Area, Ab = πr2 Where, r= radius of a cone h= height of a cone l = slant height What Are the Geometry Formulas of a Circle? The geometry formulas of a circle are listed below: Circumference = 2πr Area = πr2 Diameter = 2r Where, r = radius of a circle

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