Mensuration

Mensuration Definition
Mensuration in simple terms means measurement of different geometrical shapes.
These shapes can exist in 2 ways:

- **Two-Dimensional Shapes** – circle, triangle, square, etc.
- **Three-Dimensional Shapes** – cube, cuboid, cone, etc.

Difference Between 2D and 3D shapes

2D Shape	3D Shape
Any shape is 2D if it is bound by three or more straight lines in a plane.	A shape is a three-dimensional shape if there are several surfaces or planes around it.
There is no height or depth in these shapes.	In contrast to 2D forms, these are sometimes known as solid shapes and have height or depth.
These shapes just have length and width as their dimensions.	Since they have depth (or height), breadth, and length, they are referred to as three-dimensional objects.
We can calculate their perimeter and area.	Their volume, curved surface area, lateral surface area, or total surface area can all be calculated.

Mensuration Terminologies
Here is the list of terms you will come across in mensuration class. We have provided the term, it's abbreviation, unit and definition for easy understanding.

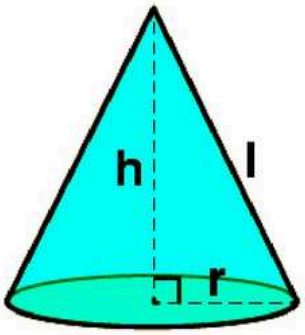
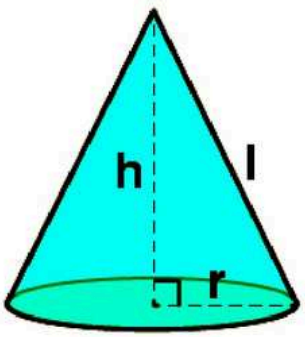
Terms	Abbreviation	Unit	Definition
Area	A	m^2 or cm^2	The surface that the closed form covers is known as the

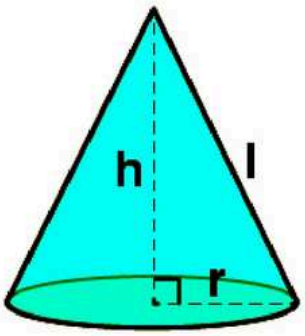
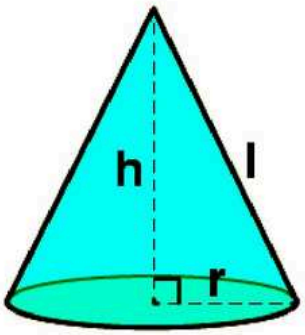
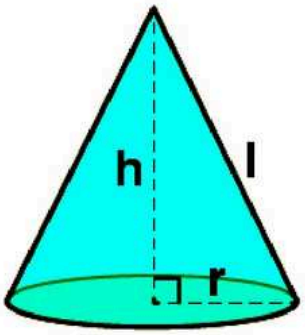
Terms	Abbreviation	Unit	Definition
			area.
Perimeter	P	cm or m	A perimeter is the length of the continuous line that encircles the specified figure.
Volume	V	cm^3 or m^3	A 3D shape's space is referred to as its volume.
Curved Surface Area	CSA	m^2 or cm^2	The overall area is known as a Curved surface area if there is a curved surface. Example: Sphere
Lateral Surface area	LSA	m^2 or cm^2	The term "Lateral Surface area" refers to the combined area of all lateral surfaces that encircle the provided figure.
Total Surface Area	TSA	m^2 or cm^2	The total surface area is the total of all the curved and lateral surface areas.
Square Unit	–	m^2 or cm^2	A square unit is the area that a square of

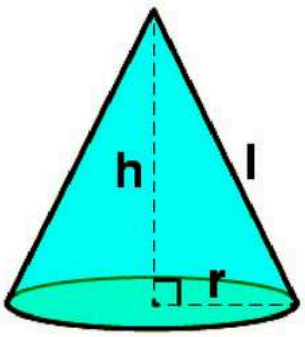
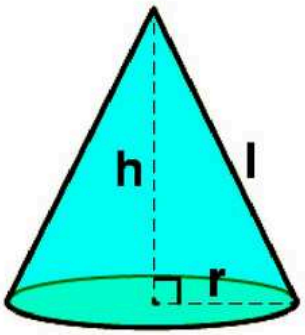
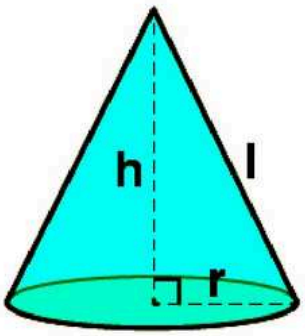
Terms	Abbreviation	Unit	Definition
			side one unit covers.
Cube Unit	–	m^3 or cm^3	The space taken up by a cube with a single side.

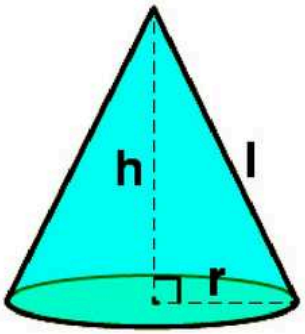
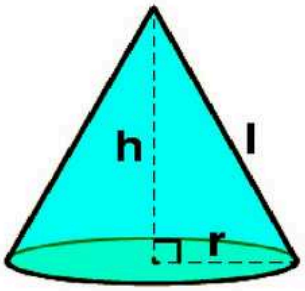
Mensuration Formulas For 2D Shapes

Below, you'll find the mensuration formulas for two-dimensional geometric shapes.

Shape	Area (Square units)	Perimeter (units)	Figure
Square	a^2	4a	
Rectangle	$l \times b$	$2 (l + b)$	

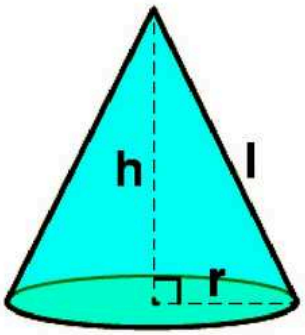
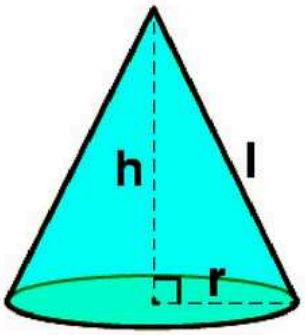
Shape	Area (Square units)	Perimeter (units)	Figure
Circle	πr^2	$2 \pi r$	
Scalene Triangle	$\sqrt{[s(s-a)(s-b)(s-c)]}$, Where, $s = (a+b+c)/2$	$a+b+c$	
Isosceles Triangle	$\frac{1}{2} \times b \times h$	$2a + b$	

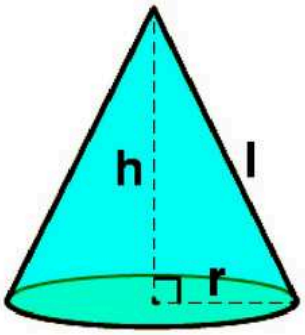
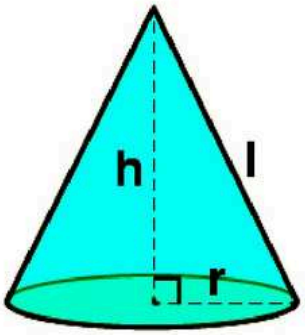
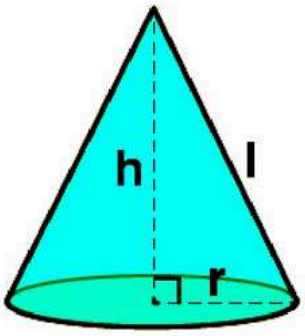
Shape	Area (Square units)	Perimeter (units)	Figure
Equilateral triangle	$(\sqrt{3}/4) \times a^2$	3a	
Right Angle Triangle	½ × b × h	b + hypotenuse + h	
Rhombus	½ × d_1 × d_2	4 × side	

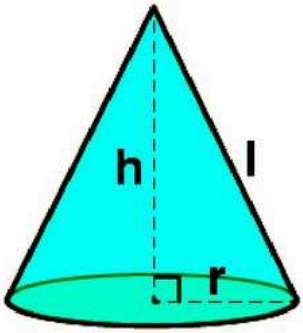
Shape	Area (Square units)	Perimeter (units)	Figure
Parallelogram	b × h	2(l+b)	
Trapezium	½ h(a+c)	a+b+c+d	

Mensuration Formulas for 3D Shapes

Here are the mensuration formulas for three-dimensional shapes in geometry.

Shape	Volume (Cubic units)	Curved Surface Area (CSA) or Lateral Surface Area (LSA) (Square units)	Total Surface Area (TSA) (Square units)	Figure
Cube	a^3	LSA = 4 a^2	6 a^2	
Cuboid	l × b × h	LSA = 2h(l + b)	2 (lb +bh +hl)	

Shape	Volume (Cubic units)	Curved Surface Area (CSA) or Lateral Surface Area (LSA) (Square units)	Total Surface Area (TSA) (Square units)	Figure
Sphere	$(4/3)\ \pi r^3$	$4\ \pi r^2$	$4\ \pi r^2$	
Hemisphere	$(⅔)\ \pi r^3$	$2\ \pi r^2$	$3\ \pi r^2$	
Cylinder	$\pi r^2 h$	$2\pi r h$	$2\pi rh + 2\pi r^2$	

Shape	Volume (Cubic units)	Curved Surface Area (CSA) or Lateral Surface Area (LSA) (Square units)	Total Surface Area (TSA) (Square units)	Figure
Cone	(⅓) π r^2 h	π r l	πr (r + l)	

EXERCISE

1. Area of a triangle with base (b) and height (h) is:

A. b.h

B. ½ b.h

C. 2 b.h

D. None of these

2. Area of the square with side-length 'a' is:

A. 2a

B. 4a

C. a/2

D. a^2

3. The area of a parallelogram with length (l) and breadth (b) is:

A. ½ lb

B. 2lb

C. lb

D. $(lb)^2$

4. Area of a circle with radius 'r' is:

A. πr^2

B. $\frac{1}{2} \pi r^2$

C. $2\pi r^2$

D. $4\pi r^2$

5. 1 cm is equal to how many millimeters?

A. 10

B. 100

C. 1/10

D. 1/100

Answer Key

1. B

2. D

3. C

4. A

5. A

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