

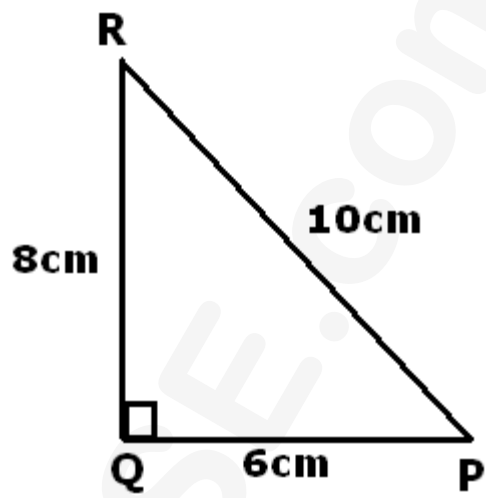
Pythagoras Theorem and its Extension

Name _____

Class _____

Roll Number _____

ICBSE.com



Objective

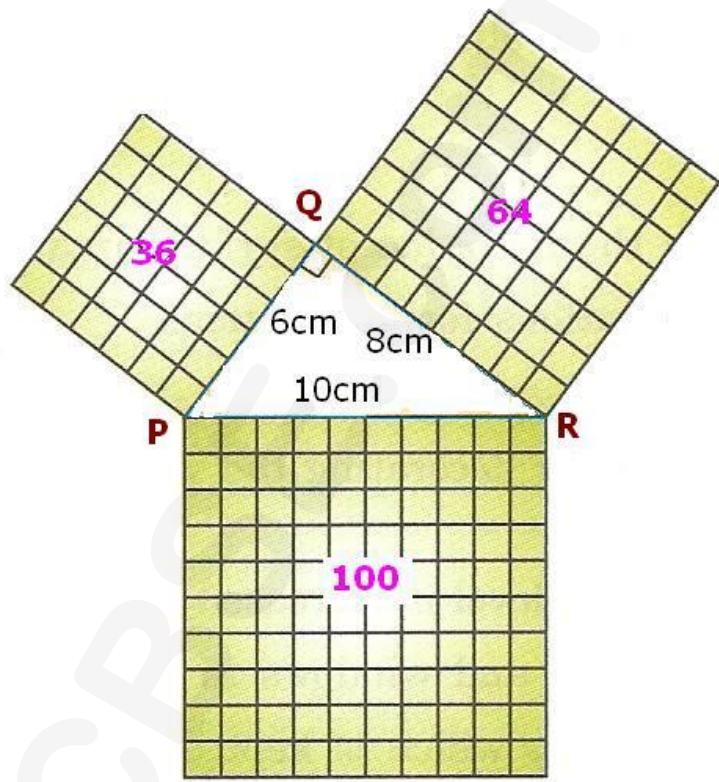
To understand the Pythagoras theorem using geometrical representation by using areas of squares on each side of a right triangle, and extending it to three dimensional objects using volumes.

Pythagoras Theorem states that square on Hypotenuse of a right triangle is equal to sum of squares on remaining two sides.

1. For a Right Triangle

Description

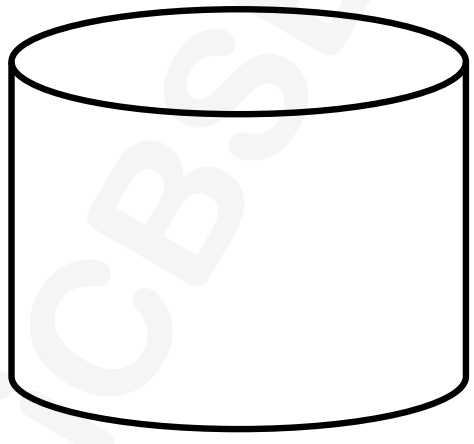
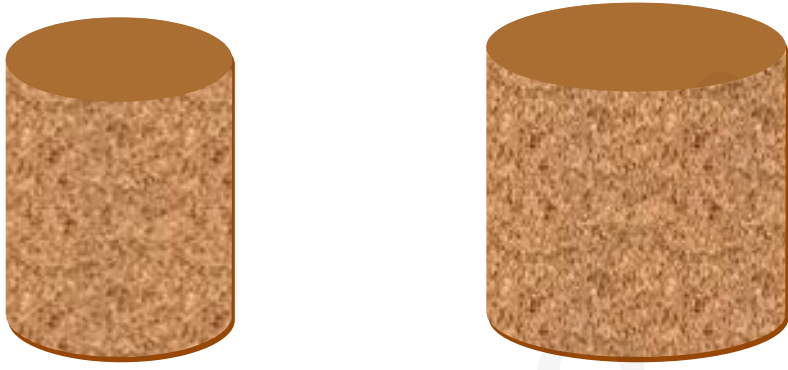
1. Cut a triangle of sides 6cm, 8cm and 10cm
2. Cut squares equal to sides of triangle.
3. Divided each square into small squares of 1cm each



Calculations

1. The number of 1 cm squares in square drawn on Side of 6 cm were 36
2. The number of 1 cm squares in square drawn on Side of 8 cm were 64
3. Sum of square on these two sides
 $= 64 + 36 = 100$
4. The number of 1 cm squares in square drawn on Side of 10 cm (hypotenuse) were 100
5. ***\therefore square on Hypotenuse of a right triangle is equal to sum of squares on remaining two sides.***

Hence Pythagoras Theorem is verified for a right triangle

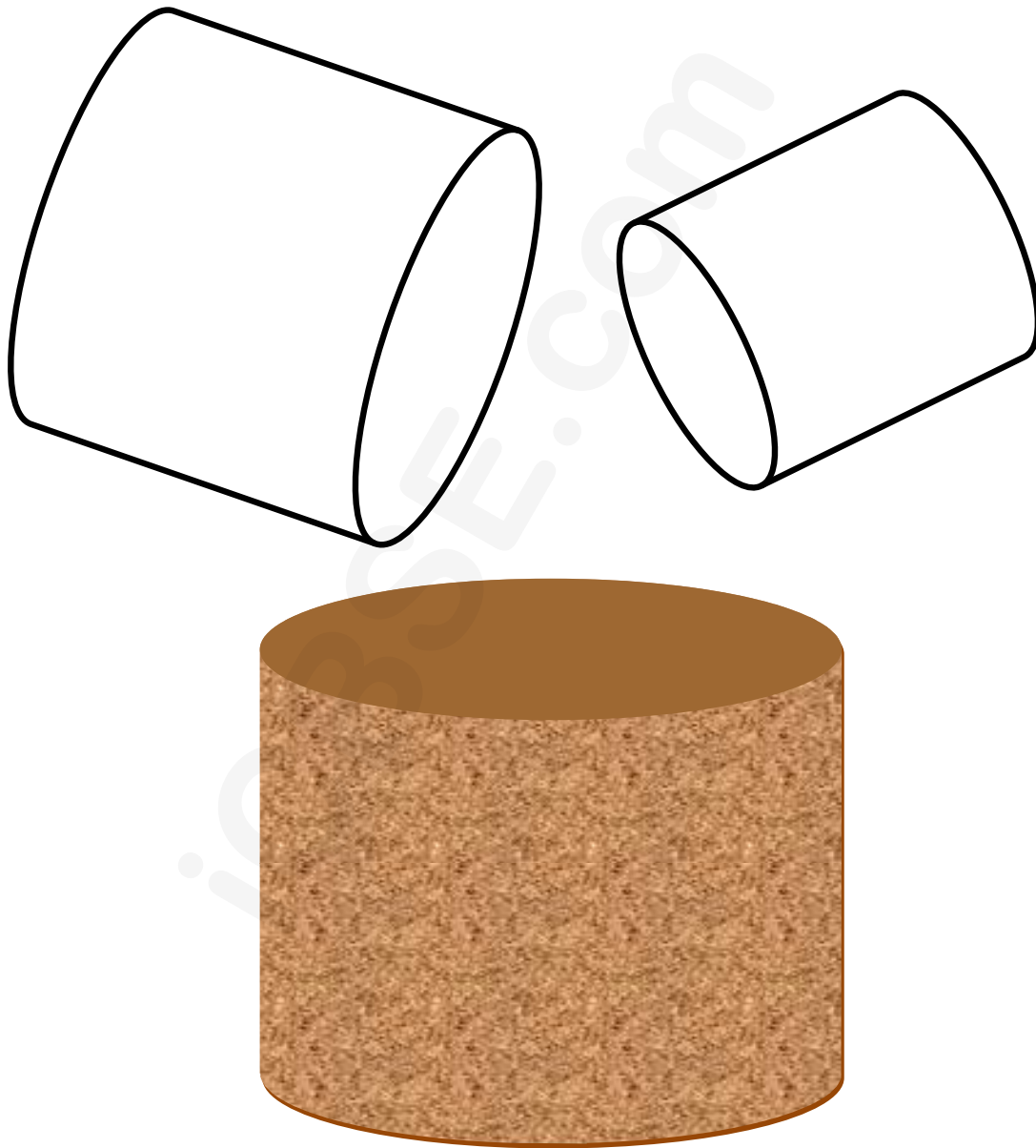


iCBSE.com

2. For Right Circular Cylinder

Description

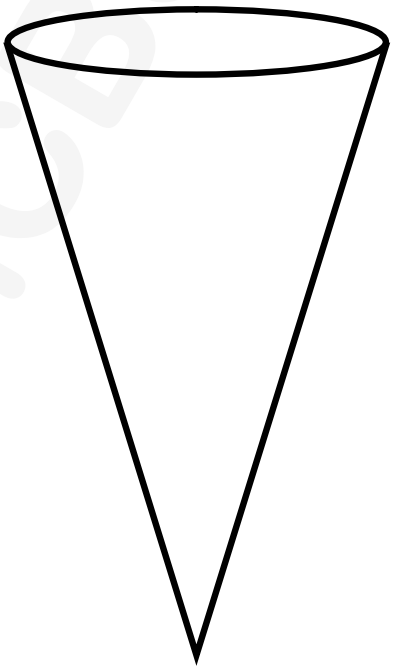
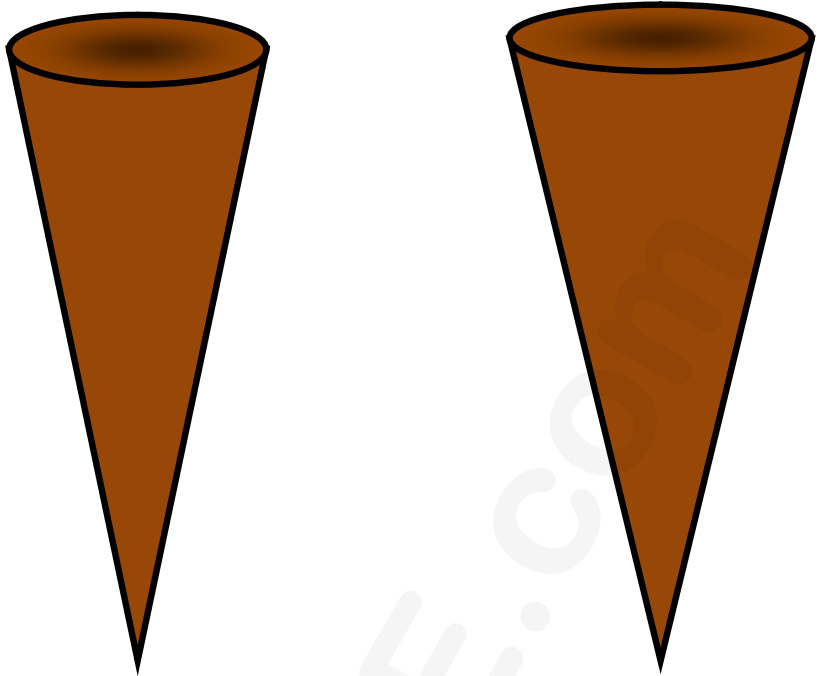
1. Took right circular cylinders of radii 6cm, 8cm and 10cm.
2. Filled the two smaller cylinders ($r = 6\text{cm}, 8\text{cm}$) with sand.
3. Keep the cylinder with $r = 10\text{ cm}$ empty.



Method

1. Poured the sand from cylinders with radii 6cm and 8cm into the biggest cylinder ($r = 10\text{cm}$).
4. We found that the bigger cylinder is completely filled with sand.
5. This shows volume of cylinder with radius 10cm = sum of volumes of the cylinders with volume 6cm and 8cm.

Hence Pythagoras Theorem can be extended for right circular cylinders



icbse.com

3. For Right Circular Cone

Description

- 1. Took right circular cone of radii 6cm, 8cm and 10cm.**
- 2. Filled the two smaller cones ($r = 6\text{cm}$, 8cm) with sand.**
- 3. Keep the cone with $r = 10\text{cm}$ empty.**

Method:

1. Poured the sand from cone with radii 6cm and 8cm into the biggest cone ($r = 10\text{cm}$).
4. We find that the bigger cone is completely filled with sand.
5. This shows volume of cone with radius 10cm = sum of volumes of the cone with volume 6 cm and 8cm.

Hence Pythagoras Theorem can be extended for right circular cone

Observation :- I observed that the Pythagoras theorem is true for right triangles and can be extended for three dimensional figures such as cylinders and cones.

