Math Made Easy Finding the Volume of a Cone

http://www.youtube.com/watch?v=B-_XM4sfLpI

How do you calculate the volume of a cone?

Listen and answer these questions.

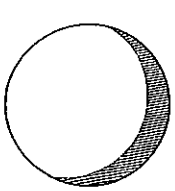
1) What happens when the ice-cream clerk is generous?
.....
2) What can happen to the cone when you put in too much ice-cream?
.....
3) What is the name of the space inside the cone?
.....
4) Which parts of the cone are circular?
.....
5) What is r, how do you get it?
.....
6) What is h and how can you measure it?
.....
7) What kind of a number is π ?
.....
8) What do you do with the fraction?
.....
9) What are the units of measure for this cone?
.....
10) Why do you have to put 3 at the end of the solution?
.....

FOCUS B

SOLID FIGURES

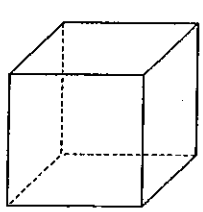
I. Look and read:

a)



This is a *sphere*. It is a locus of all points whose distance from the centre is equal to its radius.

b)



This is a *cube*. It has six square *faces*. It has eight vertices and twelve *edges*.

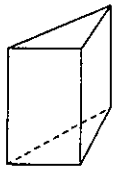
KŘEPINSKÁ, HOVŘKOVÁ, BUBENÍKOVÁ, ROZŠÍŘENÍ MATERIÁLU, MATFYZPRESS 2006

c) ***Polyhedra*** (sg. *polyhedron*)

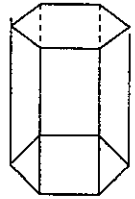
A polyhedron is a solid figure bounded by some number of plane polygonal faces. Each edge of the polyhedron joins two vertices and each edge is the common edge of two faces.
A convex polyhedron is *regular* if all its faces are alike and all its vertices are alike.

Only five kinds of *regular* convex polyhedra exist: *a tetrahedron* (with four faces, four vertices and six edges, each face is an equilateral triangle), *a hexahedron (a cube)*, *an icosahedron*, *an octahedron* and *a dodecahedron*.

These shapes are called *prisms*.



a triangular prism

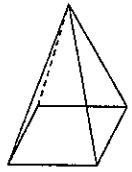


a hexagonal prism

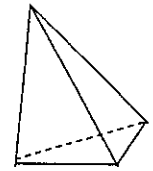
a rectangular prism

A *prism* is a convex polyhedron with *two faces* that are congruent convex polygons. They lie in parallel planes in such a way that, with *edges* joining corresponding vertices, the remaining faces are parallelograms. All faces of a regular polyhedron are congruent with each other.

These shapes are *pyramids*.



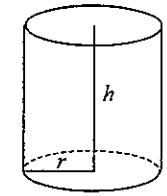
a right-square pyramid



an oblique triangular pyramid.

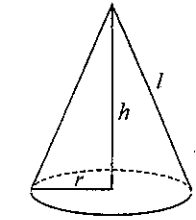
A *pyramid* is a convex polyhedron with *one face* (the *base*) a convex polygon, and the vertices of the base joined by *edges* to one other vertex (the *apex*); thus the remaining faces are all triangles.

d)



This is a *cylinder*. It consists of the *circular base* and the *curved surface* formed by the vertical line segments joining them.

e)

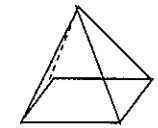


This is a right *cone*. It consists of a circle as the *base*, a *vertex* lying directly above the centre of the circle, and the *curved surface* formed by the line segment joining the vertex to the points of the circle.

f)

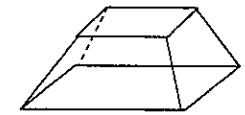
This is a *frustum* (pl. *frusta*) *of a cone*. It is the part between two parallel planes perpendicular to the axis.

2. Look and read:



This is a right square pyramid. It is *made up of five faces*. The *bottom* face is a square. Each lateral face is a *triangle with two sides equal*. The point where the lateral sides meet is called the *apex*.

Now complete the sentences describing the figure using the words given:



a) This is .....
b) ..... made up of .....
c) ..... lateral faces ..... shaped .....
d) ..... squares
e) ..... parallel.

3. Complete this table:

Solid figure	Edges	Faces	Vertices
Tetrahedron	6	4	4
Cube			
Octahedron			
Dodecahedron			
Icosahedron			
Square pyramid			
Truncated square pyramid			
Pentagonal prism			

The relationship between edges, faces and vertices is a constant. Give this constant in a formula. It is known as Euler's formula.

4. *Dimensions:*

Solid figures have three dimensions i.e. they are ***three-dimensional.***
The dimensions of solid figures are:

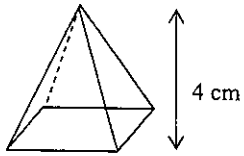
- height
- width
- length

Look at this table:

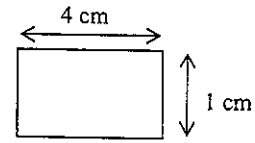
Question	*Answer*
How *high* is the building?	It is 200 meters *high.*
	The *height* of the building is 200 meters.
	It has a *height* of 200 meters.

Use the table to ask and answer questions about the following:

a) height?



b) width?
length?
area?



5. *Read and solve:*

A cylinder has a length of 65 cm. It has a radius of 10 cm.

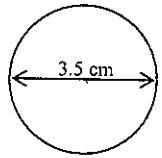
- What is its surface?
- What is its volume?

6. *Describe the shapes and the dimensions of the following:*

a) a cigarette
b) a book
c) an orange
d) a television
e) a classroom

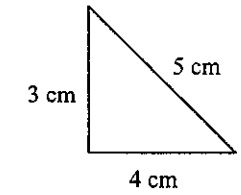
7. *Complete the following sentences and answer the questions:*

a)



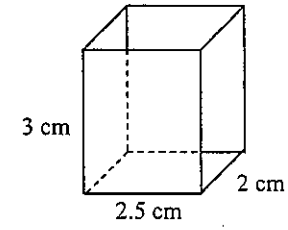
This figure is a ..... . Its ..... is 3.5 cm.
What is its area?

b)



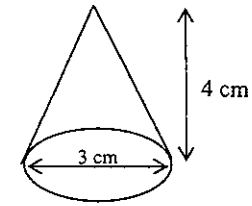
This is a ..... Its sides are 3 cm and 4 cm ..... The length of the ..... is 5 cm.
What is its area?

c)



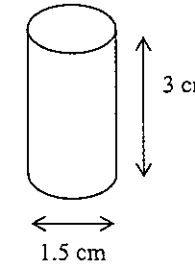
This solid figure is a ..... . Its ..... is 2.5 cm, its ..... is 2 cm and its ..... is 3 cm.
What is its surface area and its volume?

d)



This solid figure is a ..... with the ..... of 3 cm and the ..... of 4 cm.
What is its volume?

e)



This is .....
What is its surface?

FOCUS C

INVERSION

Generally means putting the verb before the subject. In ordinary spoken English, inversion is common only in questions, and after *here*, *there*, *neither*, *nor* and *so*; other uses of inversion are found mainly in written English or in a very formal style of speaking (for instance, in lectures and public speeches).