Math 10

Geometry And Packaging

Math 10

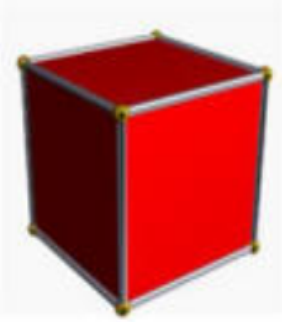
Backgound Information

Toys, foods and clothing all are packaged into boxes. These packages can be any shape or size.

Sometimes the shape and dimensions (width, depth, and height) are determined by the shape and dimension of the product. But sometimes the shape and dimensions depends on the most economical container.

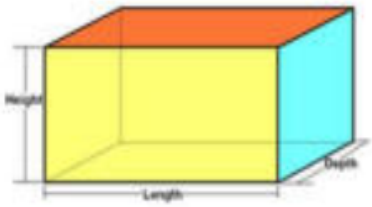
Contents that have no shape (Cereal, oil)

The naming game :)



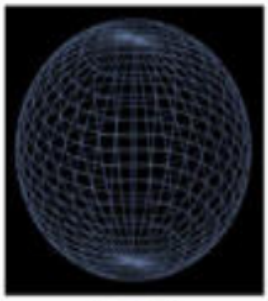
Cube

1



Rectangular Prism

2

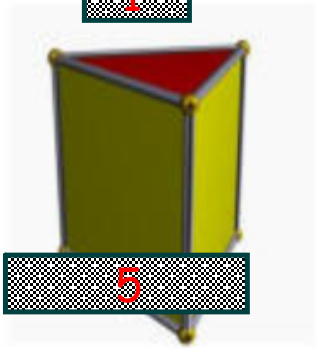


Sphere

3

Cylinder

4



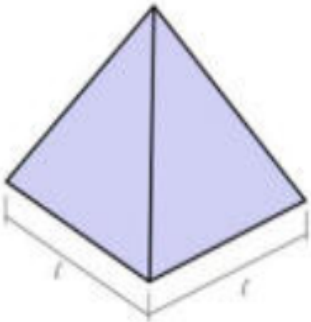
5

Triangular Prism

6

Cone

7



Pyramid

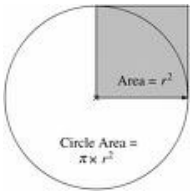
Area of Shapes

Area of a Rectangle

A = length x width

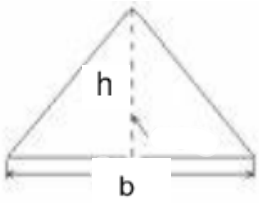
Area of a Circle

$A = \pi r^2$



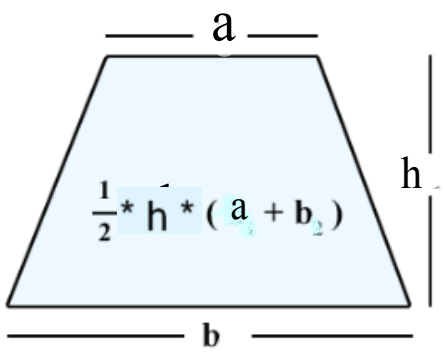
Area of Triangle

$A = \frac{1}{2}$ (base x height)



Area of Trapezoid

$A = \frac{1}{2}\,\text{height}\,(a + b)$



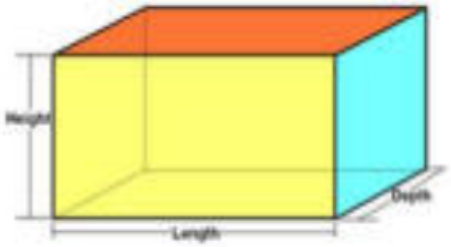
Volume of Containers

To save money volume should be close as possible to the volume of the product

We have to use cross-sections to help determine the area and volume of a container

Prisms

Triangular Prism



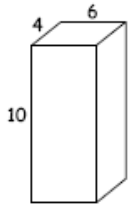
Rectangular Prism

Cylinder

Volume = (Area of the base) x Height

Find the volumes (dimensions are cm):

a.

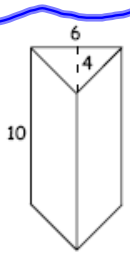


$l \times w \times H$

$4 \times 6 \times 10$

$= 240\ cm^3$

b.



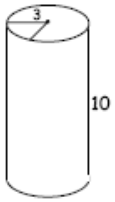
$\left(\frac{b \times h}{2}\right) \times H$

$\left(\frac{6 \times 4}{2}\right) \times 10$

$\left(\frac{24}{2}\right) \times 10$

$12 \times 10 = 120\ cm^3$

c.



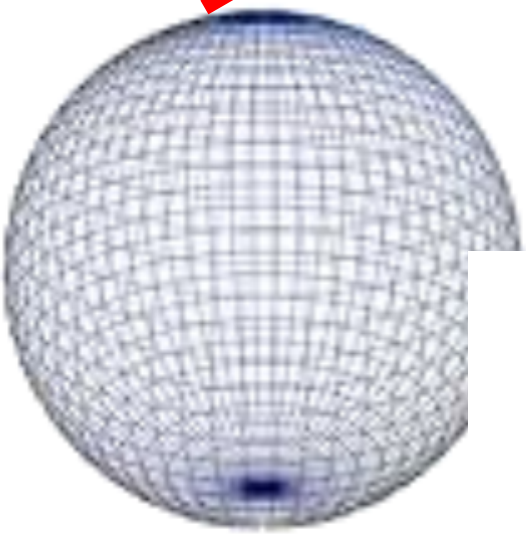
$\pi r^2 \times H$

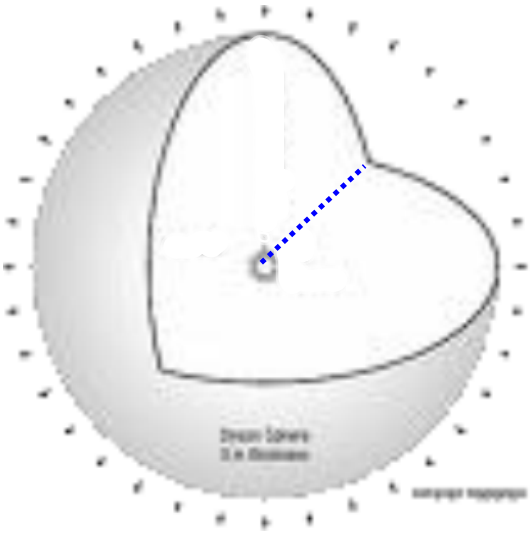
$\pi (3)^2 \times 10$

$\pi \times 9 \times 10$

$= 282.7\ cm^3$

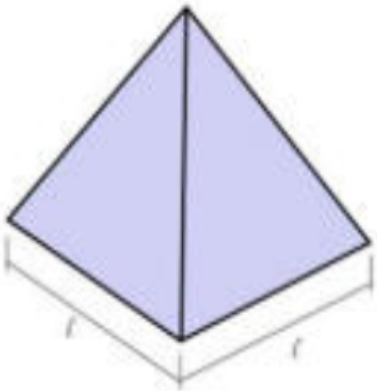
Sphere





$$V = \frac{4}{3}\pi r^3$$

Anything that comes to a point !!



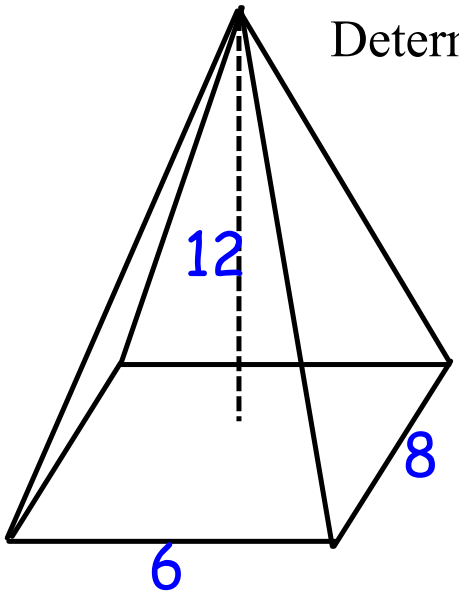
Pyramid

Pyramid or Cone

Cone

$$V = \frac{1}{3}(Area\ of\ base)\ x\ Height$$

Determine the Volume



Step 1) Find the area of the base

$l \times w$

6×8

$= 48$

Step 2) This is a pryamid.
Use the equation to find volume.

$$\frac{48 \times 12}{3}$$

$$= 192 cm^3$$

A "DrumStick" icecream bar has the following dimensions shown. What is the volume?

$$\frac{\pi r^2 \times H}{3}$$

$$\frac{\pi(4)^2 \times 13}{3}$$

$$\frac{\pi \times 16 \times 13}{3}$$

$$\frac{653.5}{3}$$

$$= 217.8$$