
Day 4 – Volume of Spheres, Prisms and Pyramids

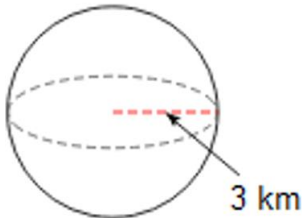
Volume is amount of space contained in an object or the number of unit cubes of a given size that will exactly fill the interior of a three dimensional figure. **Surface Area** is the total **area** of the **surface** of a three-dimensional object. Today we will learn the formulas for the volume and surface area of a sphere.

Surface Area & Volume of a Sphere

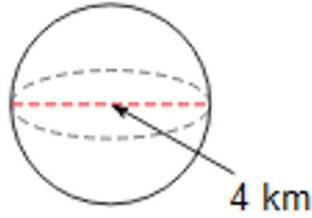
$$SA = 4\pi r^2 \qquad V = \frac{4}{3}\pi r^3$$

Where r is the radius.

1. SA = _____ & V = _____

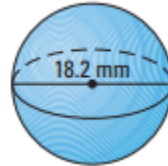
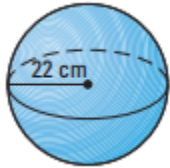


2. SA = _____ & V = _____



Practice

A. Find the volume and surface area of the spheres.



B. A rubber ball has a radius of 30 cm. What is the surface area of the ball?

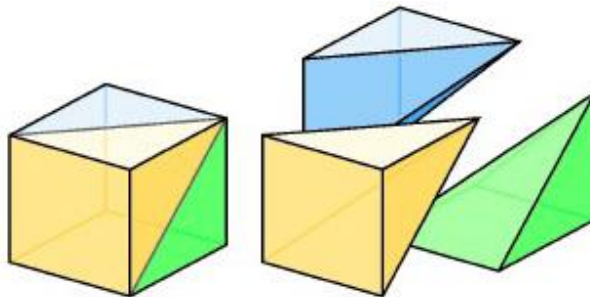
C. Find the diameter of a sphere with a volume of 972π in³.

D. Given that the volume of a sphere is 5276 cm³, find its radius.

A **prism** is a solid object with, identical ends, flat rectangular faces and bases, and the same cross section all along its length. A **pyramid** is a solid object that has a base and three or more triangular faces that meet at a point above the base. A square prism and a rectangular prism are made up of three pyramids of equal volume.

The volume of a prism is $V = Bh$,

where B is the area of the base (possible base formulas are listed below) and h is the height of the prism (distance from base to base).



Thus if I told you the volume of the above cube (a square prism) is 51 m^3 , what would you tell me is the volume of one of the pyramids that make up the cube? _____

Find the following using the same logic:

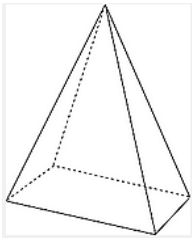
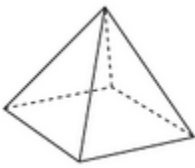
- | | |
|--|--------------------------------------|
| 1. Volume of square prism = 126 in^3 | Volume of pyramid = _____ |
| 2. Volume of square prism = 216 ft^3 | Volume of pyramid = _____ |
| 3. Volume of square prism = _____ | Volume of pyramid = 29 m^3 |

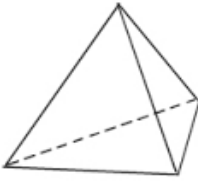
Using the information given above and our calculations, we can conclude that the volume of a pyramid is:

Volume of a Pyramid* = _____

*Considering that a pyramid can have multiple bases, whatever shape the base is you will replace B with the formula for that shape.

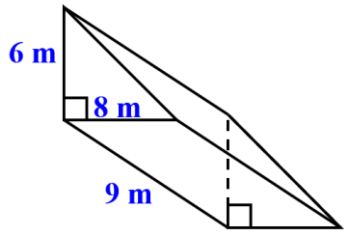
Possible Base Formulas

| | |
|---|---|
| <p>Rectangle/Square: $A = lw$</p>  | <p>Triangle: $A = \frac{bh}{2}$ or $\frac{1}{2}bh$</p>  |
|---|---|

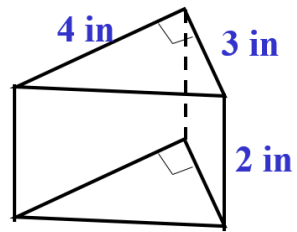


Practice: Find the volume of the following prisms and pyramids.

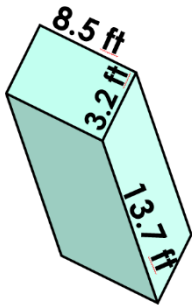
1) $V =$ _____



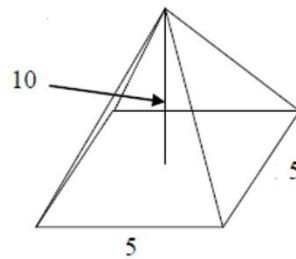
2) $V =$ _____



3) $V =$ _____



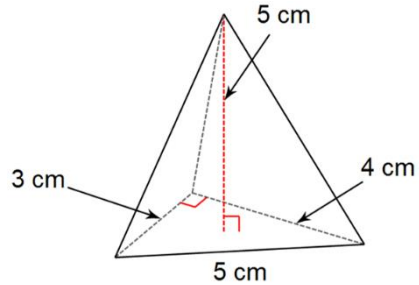
4) $V =$ _____



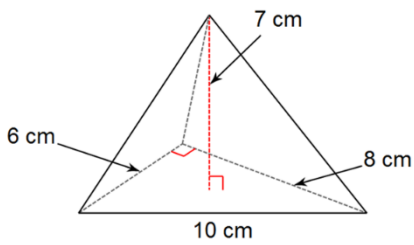
5) $V =$ _____



6) $V =$ _____



7) $V =$ _____



8) $V =$ _____

