Volumes of Prisms and Pyramids

Key

Prism: a solid having bases or ends that are parallel, congruent polygons and sides that are parallelograms.

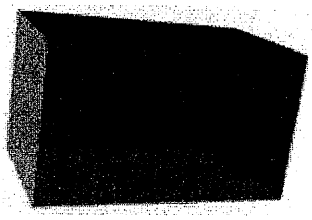
A solid object with two identical ends and flat sides:

- The sides are parallelograms (4-sided shape with opposites sides parallel)
- The cross section is the same all along its length

Cross section is is the shape made when a solid is cut through parallel to the base.
The shape of the ends give the prism a name, such as "triangular prism"

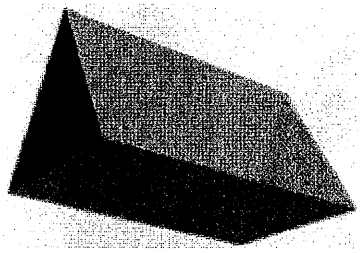
These are all Prisms:

Square Prism:

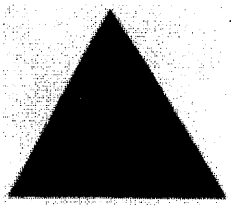


Cross-Section:

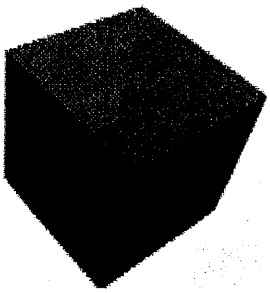
Triangular Prism:



Cross-Section:



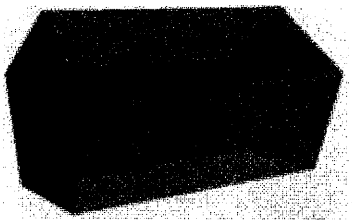
Cube:



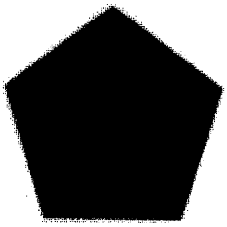
Cross-Section:

(yes, a cube is a prism, because it is a square all along its length)
(Also see Rectangular Prisms)

Pentagonal Prism:

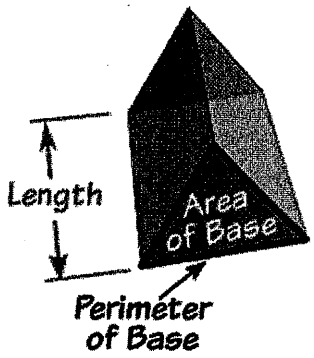


Cross-Section:

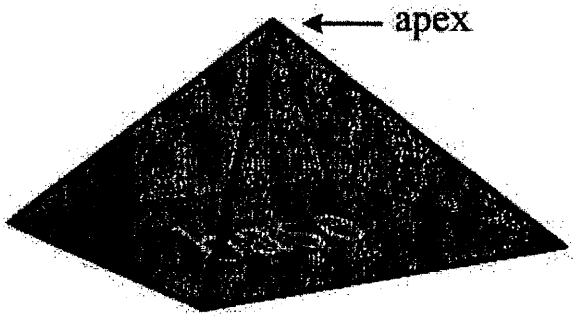


The Volume of a prism is the area of one end times the length of the prism.

Volume = Base Area × Length

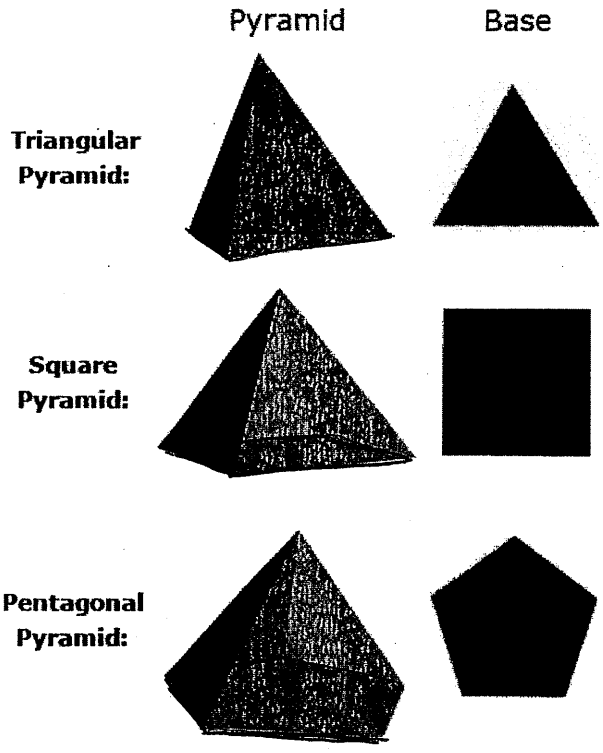


Pyramids: a shape or structure with a polygon for its base and three or more triangles for its sides which meet to form the top.



A solid object where:

- The base is a polygon (a straight-sided flat shape)
- The sides are triangles which meet at the top (the apex).



The Volume of a Pyramid

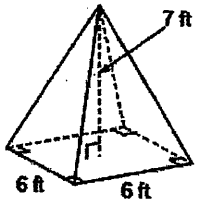
- $^1/_3$ × [Base Area] × Height

Geometry

12-4 and 12-5 Volume of Prisms and Pyramids

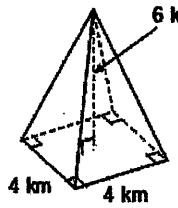
Key

Find the volume of each figure. Round your answers to the nearest hundredth, if necessary.

1) 

$\frac{1}{3} \cdot 6^2 \cdot 7$

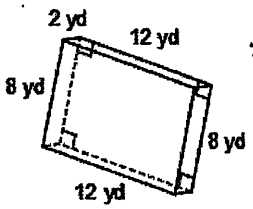
$84\ ft^3$

2) 

$\frac{1}{3} \cdot 16 \cdot 6 =$

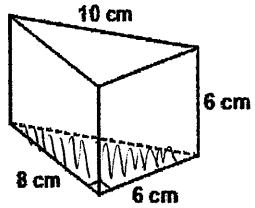
$32\ km^3$

3) $V = A_B \times h$



$= 2 \cdot 8 \cdot 12$

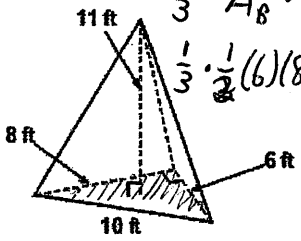
$= 192\ yd^3$

4) 

$\frac{1}{2}(6)(8) \times 6$

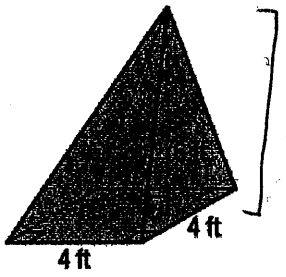
$V = 144\ cm^3$

5) $\frac{1}{3} \times A_B \times h$



$\frac{1}{3} \cdot \frac{1}{2}(6)(8) \times 11$

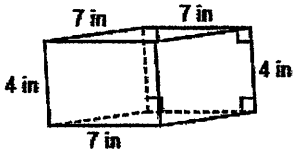
$88\ ft^3$

6) 

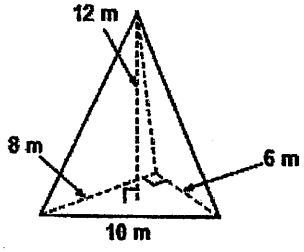
$\frac{1}{3} A_B \times h$

$\frac{1}{3}(4)^2 \times 6$

$32\ ft^3$

7) 

$7^2 \times 4 = 196\ in^3$

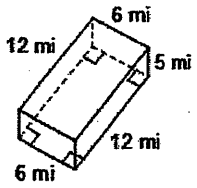
8) 

$V = \frac{1}{3} \times A_T \times h$

$V = \frac{1}{3} \times \frac{1}{2}(6)(8) \times 12$

$V = 96\ m^3$

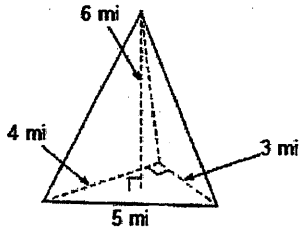
9)



$5 \times 6 \times 12$

$360 mi^3$

10)

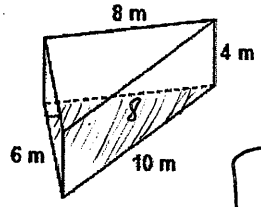


$\frac{1}{3} \times A_T \times h$

$\frac{1}{3} \times \frac{1}{2}(3)(4) \times 6$

$12 mi^3$

11)

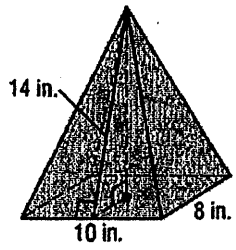


$V = A_T \times h$

$V = \frac{1}{2}(6)(8) \times 4$

$V = 48 m^3$

12)

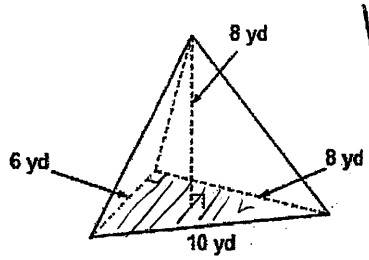


$V = \frac{1}{3} \times A_{BB} \times h$

$V = \frac{1}{3} \cdot (8)(10) \times 14$

$V = \frac{1120}{3} in^3$

13)

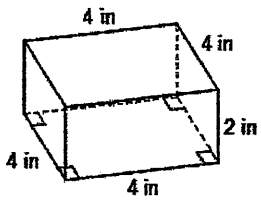


$V = \frac{1}{3} \times A_T \times h$

$V = \frac{1}{3} \times \frac{1}{2}(6)(8) \times 8$

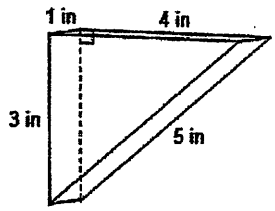
$= 64 yd^3$

14)



$V = 4^2 \times 2 = 32 in^3$

15)



$V = A_T \times h$

$= \frac{1}{2}(3)(4) \times 1$

$V = 6 in^3$