Volume of Prisms

Key

As you recall, volume is the number of cubic units it takes to fill an object. Some examples of how to measure volume are in^3, cu.cm, ft^3, cubic yds, and m^3.

A prism is a 3 - dimensional object with 2 congruent bases that are parallel and polygons and all the rest of the faces are rectangles.

To find the volume of a prism, you could fill the object with _____ and then count them very carefully. Another way to find the volume of a prism is to use the formula below:

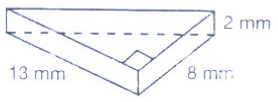
$$V = Bh$$

B → the area of the base

h → the distance between the bases (or the # of layers)

Find the volume of the two prisms below using the formula above.

1.

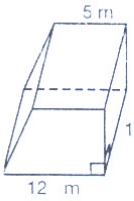


$V = Bh$ B = area of triangle $\frac{1}{2}(13)(8)$ 52

$V = (52mm^2)(2mm)$

$V = 104mm^3$

2.



B = area of trapezoid $\frac{1}{2}(5+12)7$ 59.5

$V = Bh$

$V = (59.5)18$

$V = 1071m^3$

50

As you did in last night's homework, write the formulas for the volume of the given objects.

Rectangular solid... V= LWH *Cube*... V= e^3 Cylinder... V= $\pi r^2 h$

Some questions to consider...

- Is a rectangular solid a prism? yes Why or why not? ✓
- Is a cube a prism? yes Why or why not? ✓
- Is a cylinder a prism? no Why or why not? not polygonal base

Some ideas to think about...

The rectangular solid and the cube are prisms. Therefore, the formula V= Bh should work for them as well. How are the formulas really the same?

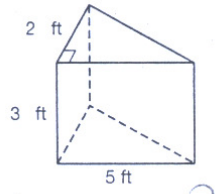
$V = l \cdot w \cdot h$ → The $l \cdot w$ = the area of the rectangular base (B)

$V = e \cdot e \cdot e$ → The $e \cdot e$ = the area of the square base (B)

The cylinder is not a prism. However, how is the formula, V= πr^2 similar to the formula V= Bh for the prism? πr^2 is the area of a circle; the cylinder has bases that are circles.

Find the volume for the figures below using the formula, V= Bh.

3.



$V = Bh$

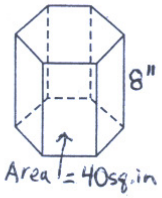
$V = (5ft^2)(3ft)$

$V = 15ft^3$

B = area of Δular base

$\frac{1}{2} \cdot 2 \cdot 5 = 5$

4.

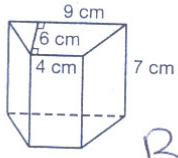


$V = Bh$

$V = 40(8)$

$V = 320$ cu. in

5.



$V = Bh$

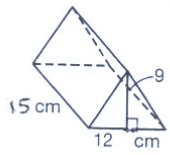
$V = 39.7$

$V = 273 cm^3$

B = area of trapezoid

$\frac{1}{2}(4+9) \cdot 6 = 39$

6.



$V = Bh$

$V = 54.15$

$V = 810 cm^3$

B = area of a Δ

$\frac{1}{2} \cdot 12 \cdot 9 = 54$