NAME: _____ DATE: _____

SURFACE AREA & VOLUME PERIOD: _____

How Do You Find Volume Of Prisms and Cylinders?

(Topic #6)

The **volume** of a three-dimensional figure is a measure of the amount of space that it occupies. Volume is measured in cubic units, such as in^3, ft^3, yd^3, cm^3, or m^3.

We can use the methods reviewed here to find the volume of certain prisms and cylinders.

Volume of a Right Prism or Cylinder

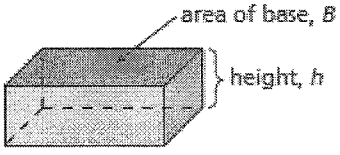
STEP 1: **Express all the dimensions of the solids using the same unit of measure, such as inches, feet, yards, or centimeters.**

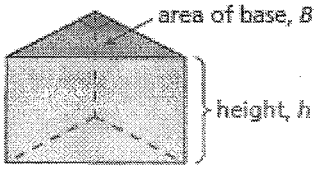
STEP 2: **Find the area of one base. Call this area B.**

STEP 3: **Find the height, *h*, of the solid.**

STEP 4: **Use the formula for volume of a right prism or circular cylinder.**

$$V = Bh$$





These are alternative formulas:

- For the **volume of a rectangular solid (a rectangular prism)**, with length, *l* width, *w*, and height, *h*, we can use the formula:

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- For the **volume of a cube** with edge, *e*, we can use the formula:

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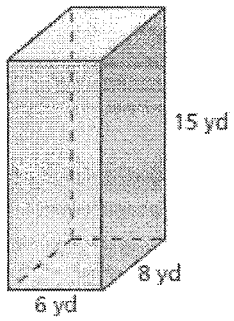
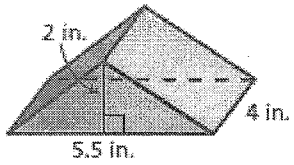
EXAMPLE 1: Finding the Volume of a Rectangular Prism

Find the volume of the prism.



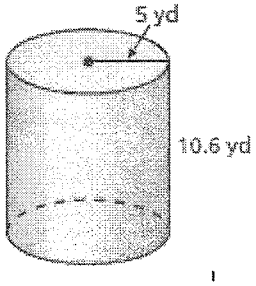
EXAMPLE 2: Finding the Volume of a Right Triangular Prism

Find the volume of the prism.



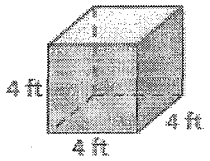
EXAMPLE 3: Finding the Volume of a Right Circular Cylinder

Find the volume of the prism.



PRACTICE: **Find the volume of the prism. Round your answer to the *nearest tenth* if necessary.**

1.



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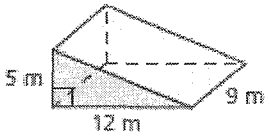

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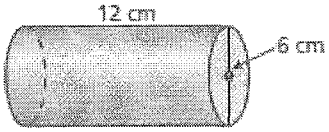

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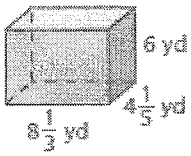


NAME: _____ DATE: _____

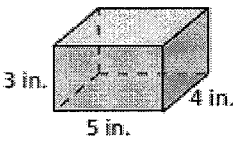
SURFACE AREA & VOLUME PERIOD: _____

HOMEWORK – (Topic #6)

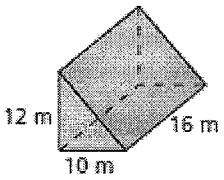
Finding Volume of Prisms & Cylinders

Find the volume of the prism or cylinder. Round your answer to the *nearest tenth* if necessary.

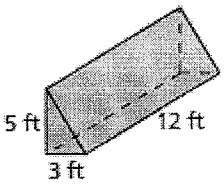
1.



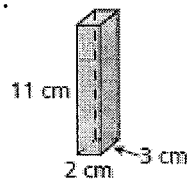
2.



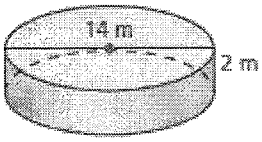
3.



4.

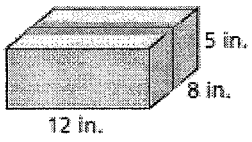


5.

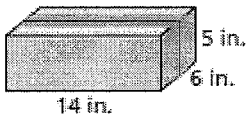


6. Each box is shaped like a rectangular prism. Which has more storage space? Explain.

Box 1



Box 2



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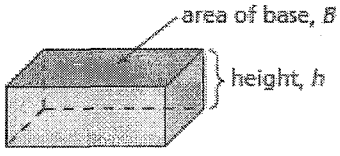

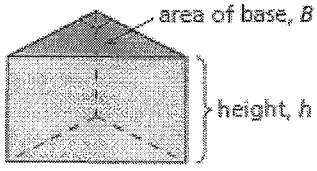

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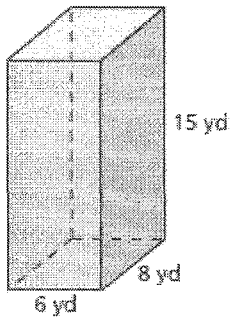
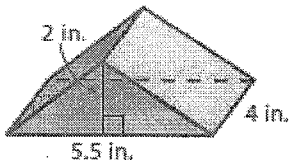


$$V = Bh$$
$$= Lw \cdot h$$
$$= (8)(6)(15)$$
$$= 720 \text{ yd}^3$$

EXAMPLE 2: Finding the Volume of a Right Triangular Prism

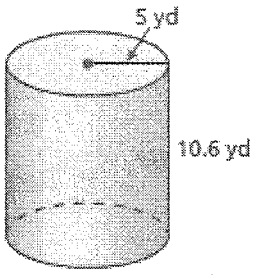
Find the volume of the prism.



$$V = Bh$$
$$= \frac{1}{2}bh \cdot h$$
$$= \frac{1}{2}(5.5)(2)(4)$$
$$= 22 \text{ in}^3$$

EXAMPLE 3: Finding the Volume of a Right Circular Cylinder

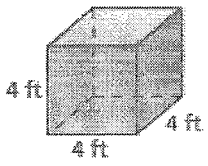
Find the volume of the prism.



$$V = Bh$$
$$= \pi r^2 \cdot h$$
$$= \pi (5)^2 (10.6)$$
$$= 832.5 \text{ yd}^3$$

PRACTICE: **Find the volume of the prism. Round your answer to the *nearest tenth* if necessary.**

1.



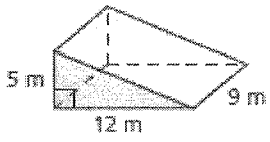
$V = Bh$

$V = s^2 \cdot h$

$V = 4^2 \cdot 4$

$V = 64 \text{ ft}^3$

2.



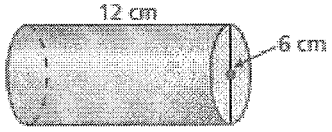
$V = Bh$

$V = \frac{1}{2}bh \cdot h$

$V = \frac{1}{2}(12)(5)(9)$

$V = 270 \text{ m}^3$

3.



$r = 3$

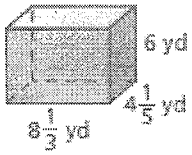
$V = Bh$

$V = \pi r^2 \cdot h$

$V = \pi (3)^2 \cdot (12)$

$V = 339.3 \text{ cm}^3$

4.



$V = Bh$

$V = l \cdot w \cdot h$

$V = \left(8\frac{1}{3}\right)\left(4\frac{1}{5}\right)(6)$

$V = 210.0 \text{ yd}^3$

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HOMEWORK – (Topic #6)

Finding Volume of Prisms & Cylinders

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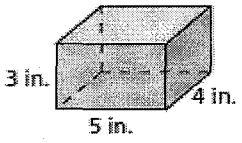
1.



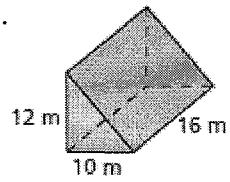
$V = Bh$

$V = lwh$

$V = 5(4)(3)$

$V = 60\ in^3$

2.



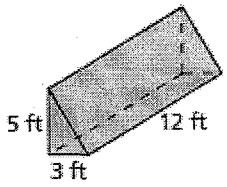
$V = Bh$

$V = \frac{1}{2}bh \cdot h$

$V = \frac{1}{2}(10)(12)(16)$

$V = 960\ m^3$

3.



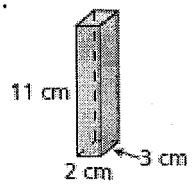
$V = Bh$

$V = \frac{1}{2}bh \cdot h$

$V = \frac{1}{2}(3)(5)(12)$

$V = 90\ ft^3$

4.



Rect. Prism

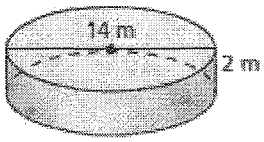
$V = Bh$ (B = area of rect.)

$V = lwh$

$V = 2(3)(11)$

$V = 66\ cm^3$

5.



$r = 7$

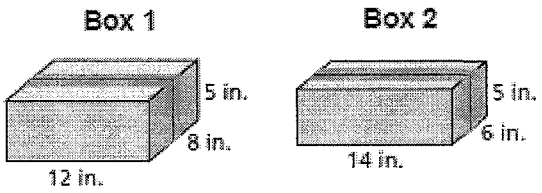
$V = Bh$

$V = \pi r^2 h$

$V = \pi(7)^2(2)$

$V = 307.9\ m^3$

6. Each box is shaped like a rectangular prism. Which has more storage space? Explain.



Box 1

$V = l w h$

$V = 12(8)(5)$

$V = 480 \text{ in}^3$

Box 2

$V = l w h$

$V = 14(6)(5)$

$V = 420 \text{ in}^3$

$V = Bh$

Box 1 can hold 480 in^3 and Box 2 can hold 420 in^3. ∴ Box 1 can hold 60 more cubic inches than Box 2.