hey

Snow Day Rituals

1. ice throw @ tree

2. PJs inside out

3. brush teeth w/ wrong end

4. pencil in freezer

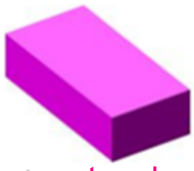
5. flush ice in toilet.

HW 9-7

Quiz Next Time

1. For each shape, describe (in a picture or in words) a cross section taken
a) parallel to the base
b) perpendicular to the base

a) circle
b) rectangle

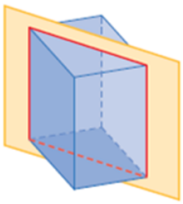


a) rectangle
b) rectangle

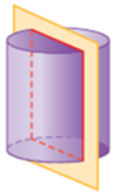
a) square
b) triangle

a) circle
b) triangle

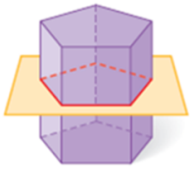
2 Describe each cross-section



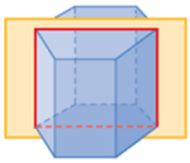
rectangle



rectangle

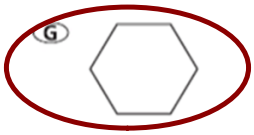


pentagon



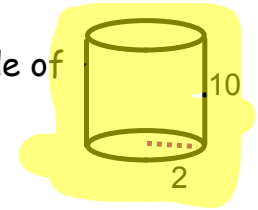
rectangle

3. Which shape best represents a hexagonal prism when viewed from the top?

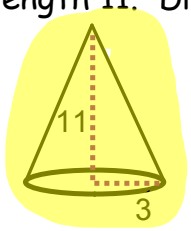
F H G  J

4. Describe the cross section obtained by cutting a plane through the diameter of the base and perpendicular to the base of a right cylinder. rectangle

5. A 2 x 10 rectangle is revolved around the side of length 2. Draw the resulting solid.



6. A right triangle with leg lengths 3 and 11 is revolved around the side of length 11. Draw the resulting solid.

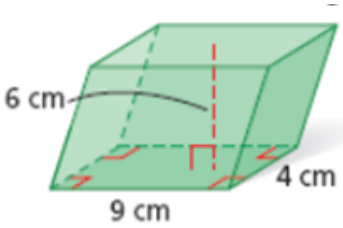


9-7

1. A cube with edge length 8 ft.

512 ft^3

2.



$V = 216\ cm^3$

3. Find the volume of a cylinder with base area $25\pi\ cm^2$ and height 3cm more than the radius.

$h = r + 3$

$h = 5 + 3$

$V = 200\pi\ cm^3 \approx 628.3\ cm^3$

$V = Bh$

$V = (25\pi)8$

$V = 200\pi\ cm^3$

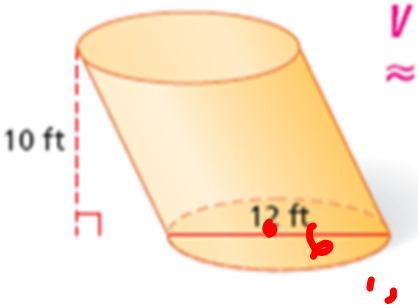
$V = 628.3\ cm^3$

$B = \pi r^2$

$25\pi = \pi r^2$

$5 = r$

4. Find the volume of each cylinder. Give your answers both in terms of π and rounded to the nearest tenth.



$V = 360\pi\ ft^3$

$\approx 1131.0\ ft^3$

$V = Bh$

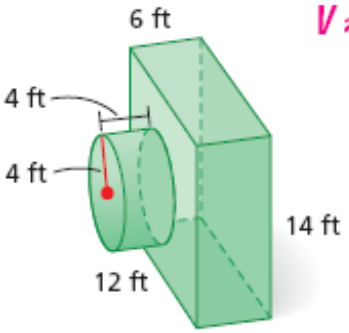
$V = (\pi r^2)h$

$V = \pi 6^2 (10)$

$V = 360\pi\ ft^3$

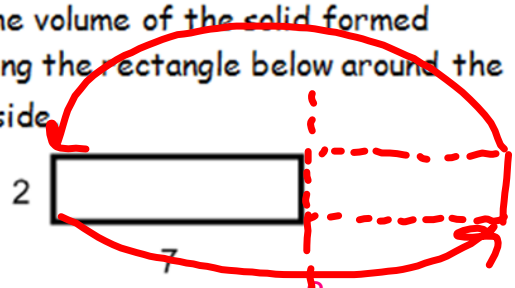
$V = 1130.4\ ft^3$

5.



$V \approx 1209.1\ ft^3$

6. Find the volume of the solid formed revolving the rectangle below around the short side.



98π units.

$V = Bh$

$V = (\pi r^2)h$

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

$V = 98\pi\ in^3$

A 4 x 8 rectangle is rotated around the side of length 8 by 360°.

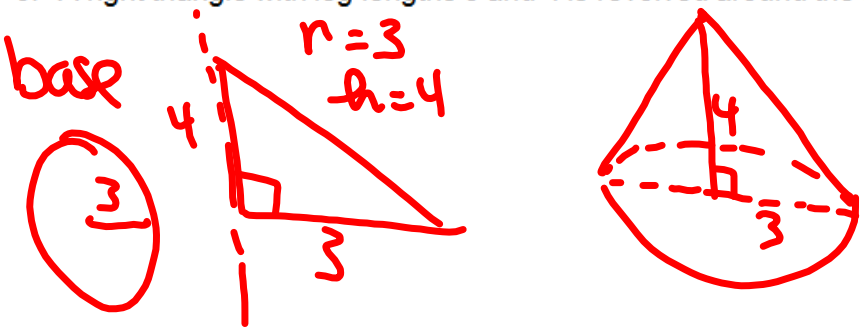
Draw the resulting shape and find the volume.

Notes 5: Volume of Pyramids and Cones

The volume of a pyramid is related to the volume of a prism with the same base and height. The relationship can be verified by dividing a cube into three congruent square pyramids, as shown.

Quiz 2 Review

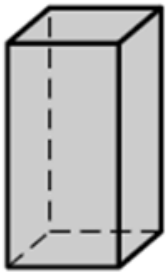
1. Name a figure that has 1 circular base. cone
2. Name a figure that has 2 circular bases. cylinder.
3. How many faces does a hexagonal prism have? 6
4. What shape is the cross section of a cone taken parallel to the base? circle
5. What shape is the cross section of a cone taken perpendicular to the base? isosceles Δ
6. A right triangle with leg lengths 3 and 4 is revolved around the side of length 4. Draw the result.



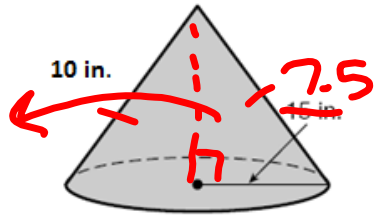
7. The dimensions of the rectangular prism are 4cm by 5cm by 10cm. What is the volume?

$V = Bh$

$200\ cm^3$



8. What is the volume of the cone in terms of π .



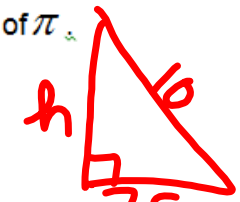
$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(7.5)^2(10)$

$V = 123.93\pi \text{ in}^3$

$V = 187.5\pi \text{ in}^3$

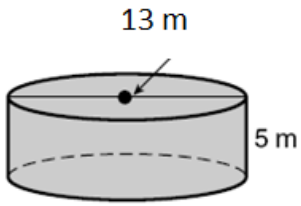
$V = 589.0 \text{ in}^3$



$7.5^2 + h^2 = 10^2$

$h = 10$

9. What is the volume of the cylinder in terms of π ?

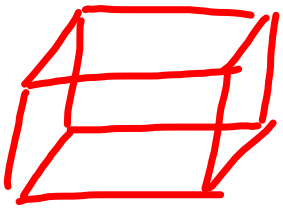


$V = Bh$

$211.25\pi m^3$

10. Given a rectangular prism:

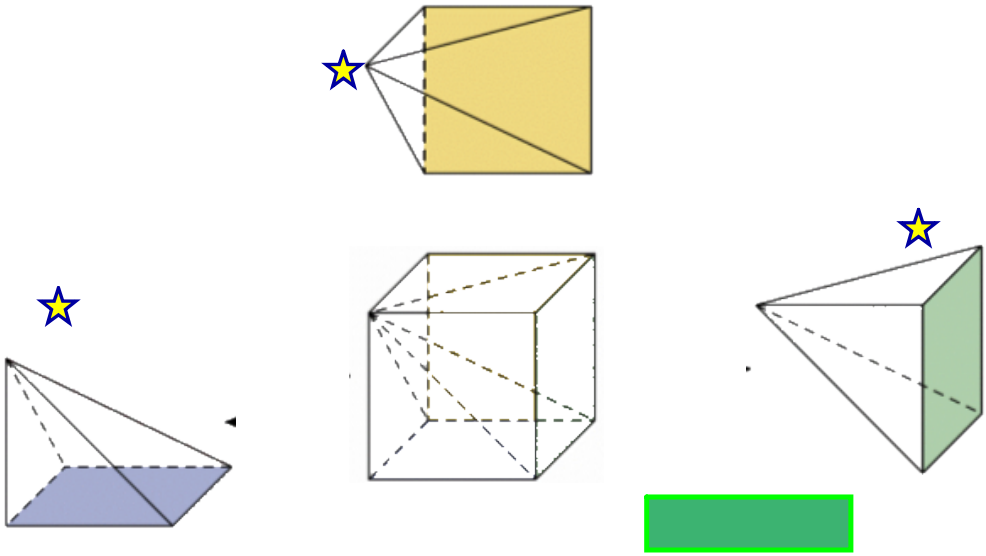
a) sketch a diagram



b) How many edges are there? 12

c) How many vertices are there? 8

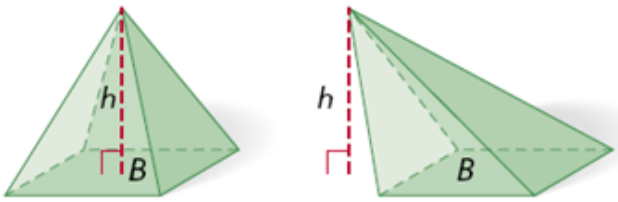
d) How many faces are there? 6



The square pyramids are congruent, so they have the same volume. The volume of each pyramid is _____ the volume of the cube.

Volume of a Pyramid

The volume of a pyramid with base area B and height h is $V = \frac{1}{3}Bh$.

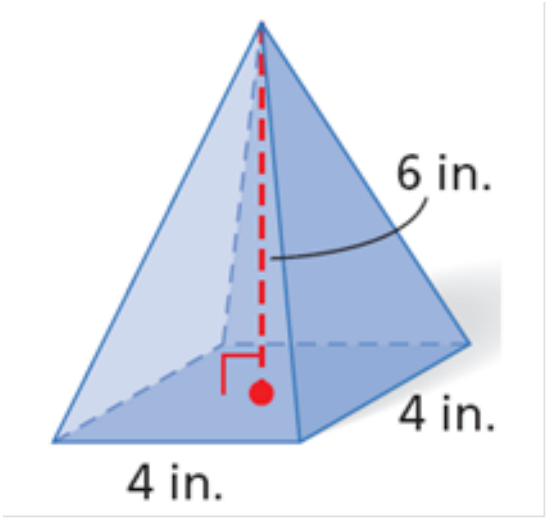


FORMULAS

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pyramid	$V = \frac{1}{3}$ (Area of Base)

Find the volume of the following examples:

1) Square Pyramid: The base is a square with a side length of 4 in. and the height is 6 in.



$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(s^2)h$

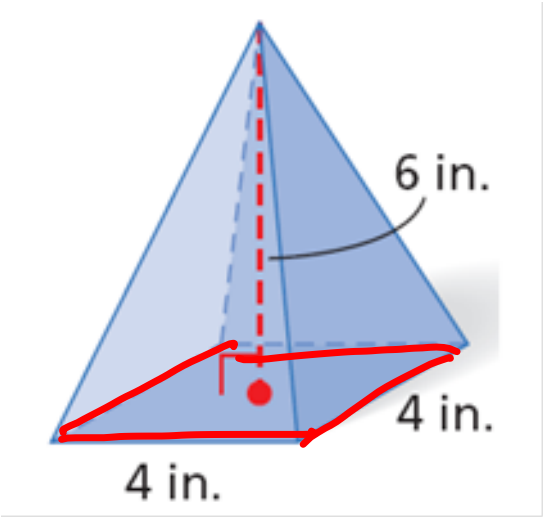
$V = \frac{1}{3}(4^2)6$

$V = \frac{1}{3}(16)6$

$V = 32\ in^3$

Find the volume of the following examples:

1) Square Pyramid: The base is a square with a side length of 4 in. and the height is 6 in.



$V = \frac{Bh}{3}$

$V = \frac{(4 \cdot 4)6}{3}$

$V = 32 in^3$

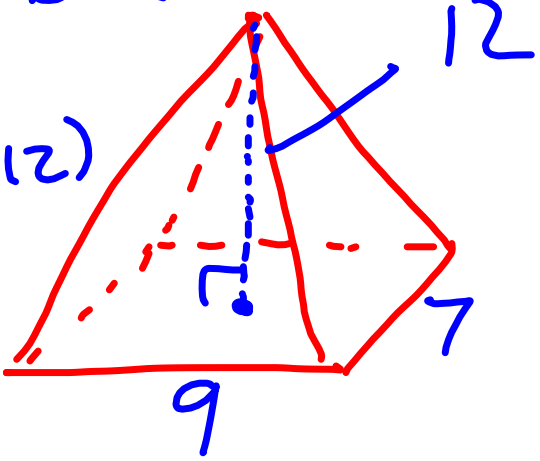
2) Find the volume a rectangular pyramid with length 7 m, width 9 m, and height 12 m.

Base

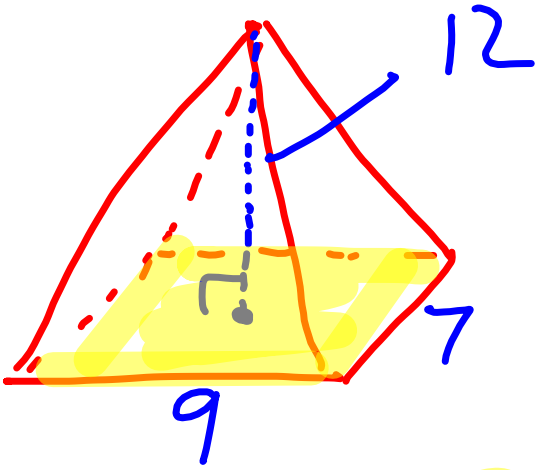
$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(7)(9)(12)$

$V = 252\,m^3$



2) Find the volume a rectangular pyramid with length 7 m, width 9 m, and height 12 m.



$$V = \frac{Bh}{3} = \frac{9(7)12}{3}$$

$$V = 252\,m^3$$

3) What would the volume of the pyramid in example 1 be if the height were tripled?

$12(3)=36$

$V=\frac{1}{3}(7)(9)(36)$

$V=756\,m^3$

If h triples → volume triples.

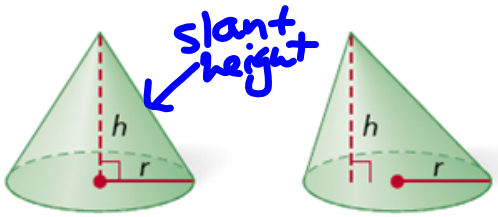
3) What would the volume of the pyramid in example 1 be if the height were tripled?

$$V = \frac{Bh}{3} \qquad \frac{(9.7)(36)}{3}$$

$$V = 756 in^3$$

Volume of Cones

The volume of a cone with base area B, radius r, and height h is $V = \frac{1}{3}Bh$, or $V = \frac{1}{3}\pi r^2 h$.



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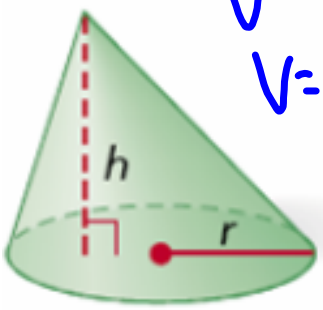
Cone	$V = \frac{1}{3}\pi r^2 h$
Pyramid	$V = \frac{1}{3}Bh$

Find the volume of the cones in the following examples:

1) Find the volume of a cone with radius 7 cm and height 15 cm. Give your answers
   a) in terms of π and
   b) rounded to the nearest tenth.



$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(7)^2(15)$

$V = 245\pi \text{ cm}^3$

$V = 769.7 \text{ cm}^3$

Find the volume of the cones in the following examples:

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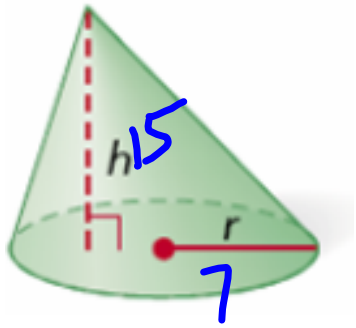


$V = \frac{\pi r^2 h}{3}$

$V = \frac{\pi (7)^2 \cdot 15}{3}$

a) $V = 245\pi \text{ cm}^3$

b) 769.7 cm^3

2) Find the volume of a cone with base circumference 25π in. and a height 2 in. more than twice the radius.

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(12.5^2)(27)$

$V = 1406.25\pi \text{ in}^3$

$V = 4417.9 \text{ in}^3$

$C = 2\pi r$

$25\pi = 2\pi r$

$\frac{25}{2} = \frac{2r}{2}$

$12.5 = r$

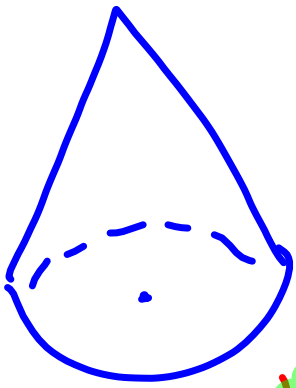
$h = 2r$

$h = 2(12.5) + 2$

$h = 25 + 2$

$h = 27$

2) Find the volume of a cone with base circumference 25π in. and a height 2 in. more than twice the radius.



$C = 25\pi$

$\frac{\pi d}{\pi} = \frac{25\pi}{\pi}$

$d = 25$

$r = 12.5$

$h = 2r + 2$

$h = 2(12.5) + 2$

$h = 25 + 2$

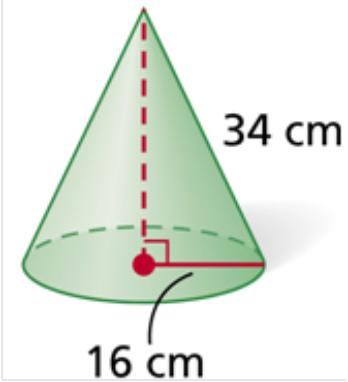
$h = 27$

$V = \frac{\pi r^2 h}{3}$

$V = \frac{\pi (12.5)^2 27}{3}$

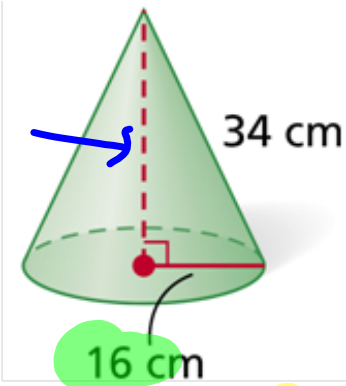
$V = 1406.25\pi \text{ in}^3$

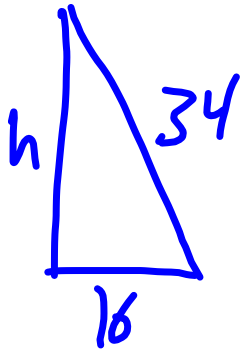
3) Find the volume of the cone.



Tyehome.
$8042.5 cm^3$

3) Find the volume of the cone.





$16^2 + h^2 = 34^2$

$256 + h^2 = 1156$

$\sqrt{h^2} = \sqrt{900}$

$h = 30$

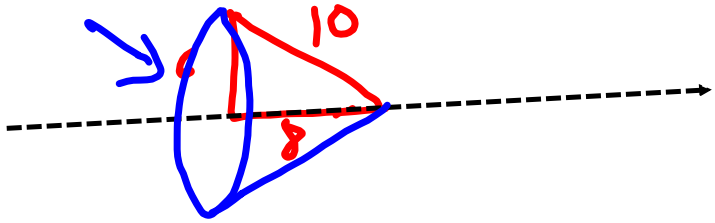
$V = \frac{\pi r^2 h}{3}$

$V = \frac{\pi (16)^2 (30)}{3}$

$2560\pi \text{ cm}^3$

4) A 6/8/10 triangle is rotated 360° around the side of length 8. Find the volume of the resulting solid.

4) A 6/8/10 triangle is rotated 360° around the side of length 8. Find the volume of the resulting solid.



Cone!

$r = 6$

$h = 8$

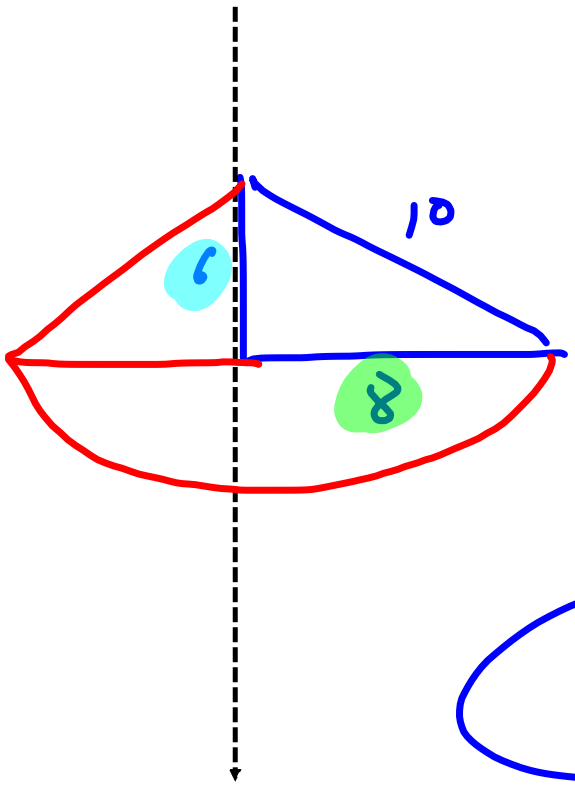
$$V = \frac{\pi r^2 h}{3}$$

$$V = \frac{\pi (6)^2 (8)}{3}$$

$$V = 96\pi$$

5) A 6/8/10 triangle is rotated 180° around the side of length 6. Find the volume of the resulting solid.

5) A 6/8/10 triangle is rotated 180° around the side of length 6. Find the volume of the resulting solid.



$V = \left(\frac{\pi r^2 h}{3}\right)\cdot\frac{1}{2}$

$V = \frac{\pi r^2 h}{6}$

$V = \frac{\pi (8)^2 6}{6}$

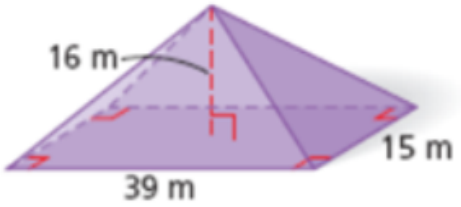
$V = 64\pi$

HW:
HW Packet 9-8

"Quiz 2 Review" will help you study for the quiz in 2 days!

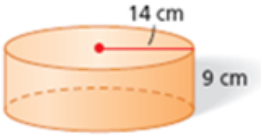
HW:
HW Packet 9-8

1. Find the volume of the pyramid.



Find the volume of the cylinders. Give your answer in terms of π and rounded to the nearest tenth.

17.



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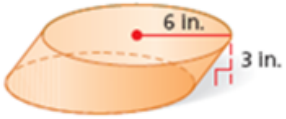
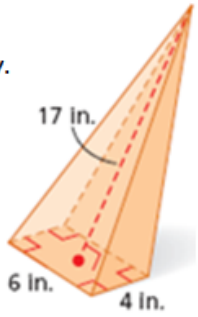
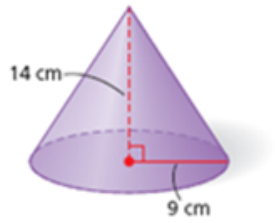


2. Find the volume of the pyramid. Round to the nearest tenth if necessary.

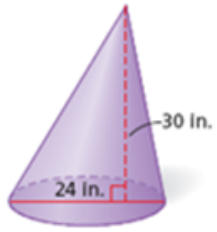
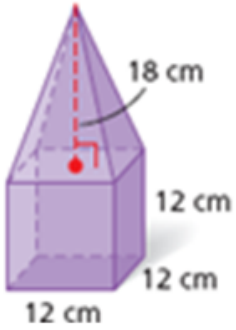


Find the volume of each cone. Give answers in terms of π and rounded to the nearest tenth.

6.



7.



11. Find the volume of the composite figure to the right. Round to the nearest tenth if necessary.