

Euclidean Geometry

April 20 – April 24

Time Allotment: 40 minutes per day

Student Name: _____

Teacher Name: _____

Packet Overview

Date	Objective(s)	Page Number
Monday, April 20	1. Identify the parts of cylinders	2
Tuesday, April 21	1. Identify the parts cones	4
Wednesday, April 22	1. Calculate Lateral Area, Total Area, and Volume of Cylinders & Cones	6
Thursday, April 23	1. Minor Assessment	8

Additional Notes: Hello students!,

This week we will be working with Cylinders & Cones!!!

Make sure you are reading carefully as you go through these lessons with a pencil in your hand (NO PENS). You should always be underlining, circling, taking margin notes etc.

Do all of your work on sheet of notebook paper. You can keep your packet, but you will need to turn in the work you do on a piece of notebook paper.

Mr. Bernstein will have office hours at the following times

- 1st Period 10:00-10:50am Mondays & Wednesdays
- 5th Period 11:00- 11:50 am Tuesdays & Thursdays

Miss McCafferty will hold office hours at the following times:

- 1st Period 10:00-10:50 am Mondays & Wednesdays
- 3rd Period 1:00- 1:50 pm Mondays & Wednesdays
- 4th Period 10:00-10:50 am Tuesdays & Thursdays
- 6th Period 1:00- 1:50 pm Tuesdays & Thursdays

Love,

Miss McCafferty and Mr. Bernstein

The answer key to each lesson will be at the end of each lesson. The answer keys should only be used when checking work.

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.

Student signature:

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.

Parent signature:

Monday, April 20

Geometry Unit: 3-D Figures

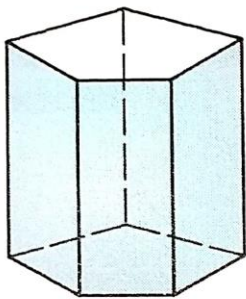
Lesson 1: Cylinders

Objective: Be able to do this by the end of this lesson.

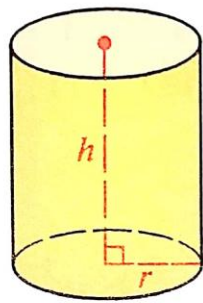
1. Identify the parts of cylinders

Notes**12-3** *Cylinders and Cones*

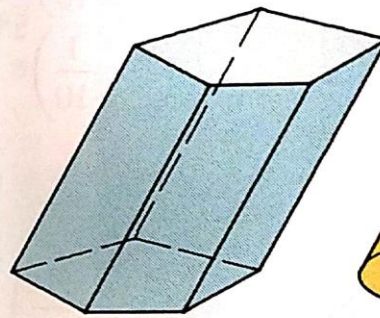
A **cylinder** is like a prism except that its bases are circles instead of polygons. In a **right cylinder**, the segment joining the centers of the circular bases is an **altitude**. The length of an altitude is called the *height*, h , of the cylinder. A radius of a base is also called a **radius**, r , of the cylinder.



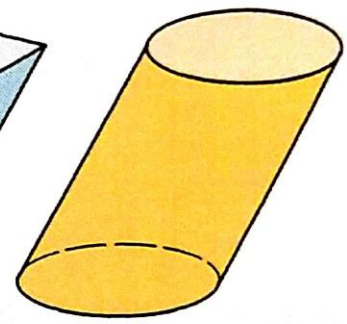
Right prism



Right cylinder



Oblique prism



Oblique cylinder

The diagrams above show the relationship between prisms and cylinders. In the discussion and exercises that follow, the word “cylinder” will always refer to a right cylinder.

It is not surprising that the formulas for cylinders are related to those for prisms: $L.A. = ph$ and $V = Bh$. Since the base of a cylinder is a circle, we substitute $2\pi r$ for p and πr^2 for B and get the following formulas.

Theorem 12-5

The lateral area of a cylinder equals the circumference of a base times the height of the cylinder. ($L.A. = 2\pi rh$)

Theorem 12-6

The volume of a cylinder equals the area of a base times the height of the cylinder. ($V = \pi r^2 h$)

Answer the following questions IN COMPLETE SENTENCES on a separate sheet of notebook paper. Title the page: Mon. Apr. 20

1. How is a cylinder like a prism?
2. What is the name of the straight line segment that starts at the center of a circle and ends at the circumference?
3. What is the altitude of a cylinder?
4. What is the formula for the Lateral Area (L.A.) of a cylinder?
5. What is the formula for the volume of a cylinder?
6. What is the formula for the Lateral Area of a right Prism?
7. What is the formula for the volume of a right prism?
8. Name 10 objects in your house that are cylinders.
9. Sketch a cylinder.

Tuesday, April 21

Geometry Unit: 3-D Figures

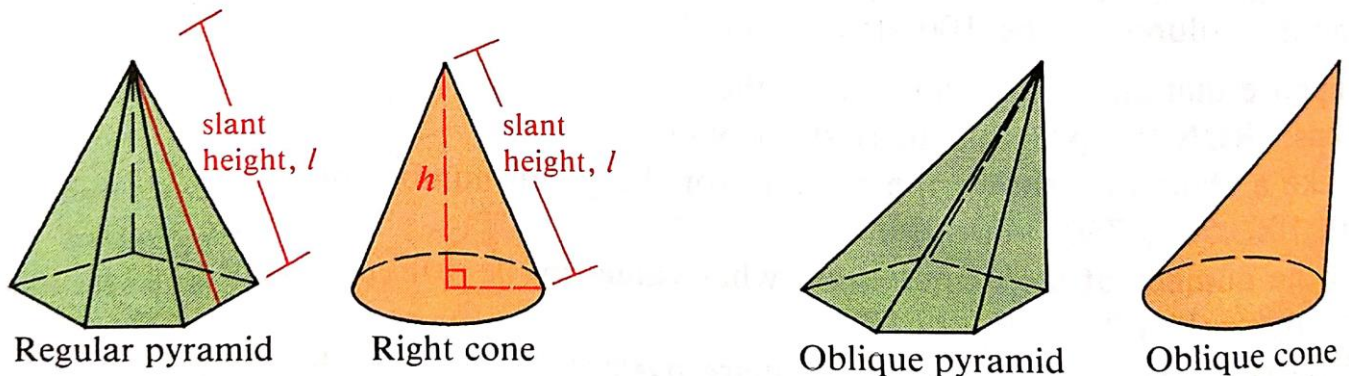
Lesson 2: Cones

Objective: Be able to do this by the end of this lesson.

1. Identify the parts cones

Notes

A **cone** is like a pyramid except that its base is a circle instead of a polygon. The relationship between pyramids and cones is shown in the diagrams below.



Note that “slant height” applies only to a regular pyramid and a right cone. We will use the word “cone” to refer to a right cone.

The formulas for cones are related to those for pyramids: $L.A. = \frac{1}{2}pl$ and $V = \frac{1}{3}Bh$. Since the base of a cone is a circle, we again substitute $2\pi r$ for p and πr^2 for B and get the following formulas.

Theorem 12-7

The lateral area of a cone equals half the circumference of the base times the slant height. ($L.A. = \frac{1}{2} \cdot 2\pi r \cdot l$, or $L.A. = \pi rl$)

Theorem 12-8

The volume of a cone equals one third the area of the base times the height of the cone. ($V = \frac{1}{3}\pi r^2 h$)

Answer the following questions IN COMPLETE SENTENCES on a separate sheet of notebook paper. Title the page: Tue., Apr. 21

1. Which Solid figure is the cone like?
2. How is a cone different from a pyramid?
3. Which type of pyramid has a slant height?
4. Which type of cone has a slant height?
5. What is the formula for the lateral area of a pyramid?
6. What is the formula for the lateral area of a cone?
7. What is the formula for the volume of a pyramid?
8. What is the formula for the volume of a cone?
9. What is the formula for the circumference of a circle? (you can look back at your notes)
10. What is the formula for the area of a circle? (you can look back at your notes)
11. List 5 objects that are shaped like cones.
12. Sketch a cone.

Wednesday, April 22

Geometry Unit: 3-D Figures

Lesson 3: Cylinders & Cones

Objective: Be able to do this by the end of this lesson.

1. Calculate Lateral Area, Total Area, and Volume of Cylinders & Cones

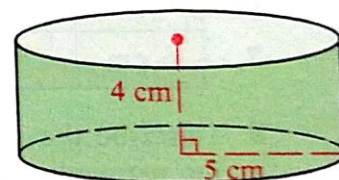
Notes

So far our study of solids has not included formulas for oblique solids. The volume formulas for cylinders and cones, but *not* the area formulas, can be used for the corresponding oblique solids. (See the Extra on pages 516–517.)

Example 1 A cylinder has radius 5 cm and height 4 cm. Find the (a) lateral area, (b) total area, and (c) volume of the cylinder.

Solution

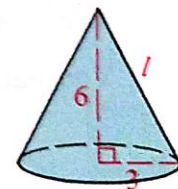
- a. $L.A. = 2\pi rh = 2\pi \cdot 5 \cdot 4 = 40\pi$ (cm²)
- b. $T.A. = L.A. + 2B$
 $= 40\pi + 2(\pi \cdot 5^2) = 90\pi$ (cm²)
- c. $V = \pi r^2 h = \pi \cdot 5^2 \cdot 4 = 100\pi$ (cm³)



Example 2 Find the (a) lateral area, (b) total area, and (c) volume of the cone shown.

Solution

- a. First use the Pythagorean Theorem to find l .
 $l = \sqrt{6^2 + 3^2} = \sqrt{45} = 3\sqrt{5}$
 $L.A. = \pi rl = \pi \cdot 3 \cdot 3\sqrt{5} = 9\pi\sqrt{5}$
- b. $T.A. = L.A. + B = 9\pi\sqrt{5} + \pi \cdot 3^2 = 9\pi\sqrt{5} + 9\pi$
- c. $V = \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi \cdot 3^2 \cdot 6 = 18\pi$



Answer the following questions on a separate sheet of notebook paper. Show your work. Title the page: Wed., Apr. 22, pg. 6

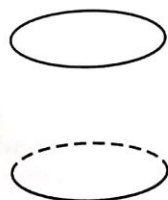
1. In example 1 what is the area of the base?
2. In example 1 what is the circumference of the base?
3. In example 2 what is the area of the base?
4. In example 2 what is the circumference of the base?
5. In example 2 what is the slant height?

Answer the following questions on a separate sheet of notebook paper. Show your work. Title the page: Wed., Apr. 22, pg. 7

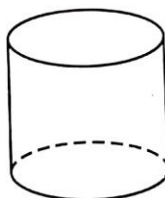
Do the odd numbered problems

Written Exercises

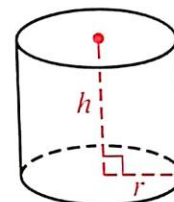
You can use the following three steps to sketch a cylinder.



(1) Draw two congruent ovals, one above the other.



(2) Join the ovals with two vertical segments.



(3) Draw in the altitude and a radius.

Sketch each cylinder. Then find its lateral area, total area, and volume.

1. $r = 4; h = 5$
2. $r = 8; h = 10$
3. $r = 4; h = 3$
4. $r = 8; h = 15$
5. The volume of a cylinder is 64π . If $r = h$, find r .
6. The lateral area of a cylinder is 18π . If $h = 6$, find r .
7. The volume of a cylinder is 72π . If $h = 8$, find the lateral area.
8. The total area of a cylinder is 100π . If $r = h$, find r .

Answer Key pg. 6

1. 78.53 cm^2
2. 31.42 cm
3. 28.27 cm^2
4. 18.85 sm
5. $3\sqrt{5}$ units

Answer Key pg. 7

1. $40\pi; 72\pi; 80\pi$
3. $24\pi; 56\pi; 48\pi$
5. 4
7. 48π

Thursday, April 23

Geometry Unit: 3-D Figures

Lesson 5: Review

Use your notes from the past few weeks to help you complete the following problems

Answer the following questions on a separate sheet of notebook paper. Show your work. Title the page: Thurs., Apr. 23, pg. 8

For Exercises 1–5 find the lateral area, total area, and volume of each solid.

1. A rectangular solid with length 10, width 8, and height 4.5
2. A regular square pyramid with base edge 24 and slant height 13
3. A cylinder with radius 10 in. and height 7 in.
4. A right hexagonal prism with height 5 cm and base edge 6 cm
5. A cone with height 12 and radius 9