

Lesson 1.01 Undefined Terms & Notation

Students will be able to:

- **Content Objective:** Define a point, line, and plane and express each using notation.
- **Language Objective:** Discuss and identify points, lines, and planes.



Warm Up

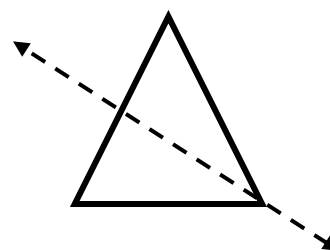
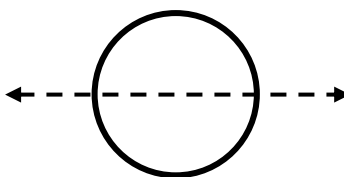
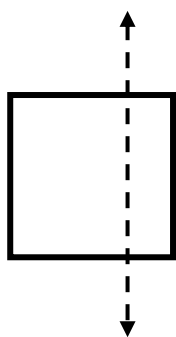
Identify each shape below and whether each line represents a line of symmetry by circling yes or no.

- a. Shape: _____ b. Shape: _____ c. Shape: _____

Line of symmetry? Yes or No

Line of symmetry? Yes or No

Line of symmetry? Yes or No

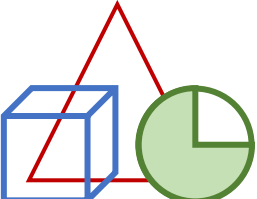


- d. You were able to complete the warmup based on your prior knowledge of shapes and symmetry. But are you 100% certain that your answers are correct? Discuss with a partner.

Up until this point, we have made assumptions on distance and measurement. For example, we can “conclude” that two pieces of wood “look” the same length or that two lines “look” parallel. What would happen if you tried to build a house this way? Would it be structurally sound? These questions express why Geometry is an important study of mathematics.

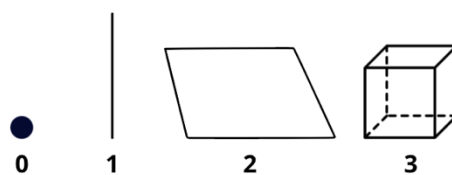


Vocabulary Review

Geometry	Euclidean Geometry
<p>The study of properties of space in relation to shape, size, angle, and distance.</p> <p>There are many studies of geometry however, in this course, we will focus on Euclidean Geometry.</p>	<p>The study of <u>plane</u> and <u>solid</u> figures described in “Elements”.</p> <p>“Elements”- one of the oldest mathematical works written by Greek mathematician, Euclid.</p> 



Graphic Organizer



DIMENSIONS

Point	Line
A position in space with <u>zero dimension</u> .	A <u>one-dimensional</u> figure made up of a set of points that extend infinitely in opposite directions.
Plane	Solid
A <u>two-dimensional</u> flat surface, made up of a set of points, with length and width but no thickness. (2D)	A <u>three-dimensional</u> figure with length, width, and height. (3D)

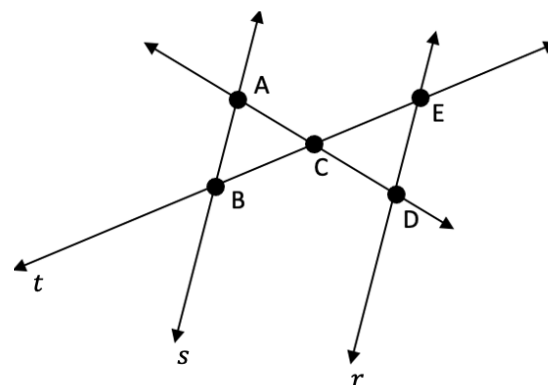


Skill 1: Line & Line Segment Notation

Answer the questions below based on the given diagram.

a. Does the name “line B ” refer to a unique line? Explain why or why not.

b. Does the name “line AB ”, denoted \overleftrightarrow{AB} , refer to a unique line? Explain why or why not.



c. What is another name for “line DE ”?

d. How many points are needed to describe a distinct line?

e. A **line segment** is a part of a line with two endpoints, for example \overline{AB} . Name another line segment shown in the diagram using the same notation.

f. Can \overleftrightarrow{AD} , also be expressed as \overleftrightarrow{AD} ? Explain.


Exercise 1: Line & Line Segment Notation

For each description below, draw an illustration and express in symbolic notation. The first one has been done for you.

 a. Line XY

 b. Line Segment UV

 c. Line PR

Illustration:

 Symbolic Notation: = \overleftrightarrow{XY}

d. How many lines can be drawn through a single point?

 e. Do \overleftrightarrow{EF} and \overleftrightarrow{FE} represent the same line segment? Explain.

Skill 2: Points, Lines, & Planes

Use the diagram below to answer parts a. and b.

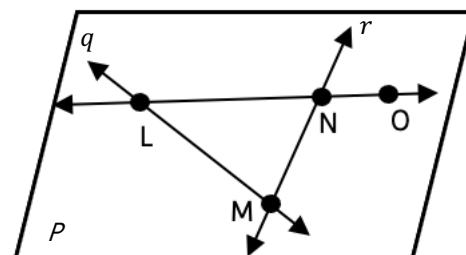
 a. A set of points that lie on the same line are called **collinear**. What three points are collinear?

b. List all points, lines, and planes, written in symbolic notation.

Points: _____

Lines: _____

Planes: _____


 c. Why can't we express "Plane P " as "Plane LNO "?

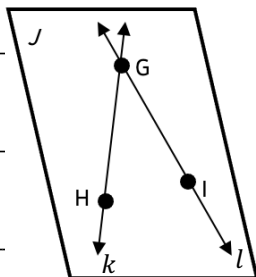
Write It Out

Using the diagram, list all points, lines, and planes, written in symbolic notation.

Points: _____

Lines: _____

Planes: _____


Check Point

Keira expresses the illustration below as \overleftrightarrow{ED} and Caleb expresses the illustration as \overleftrightarrow{FE} . Who is correct?



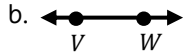


1.01- Problem Set

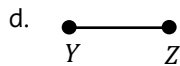
Name: _____

1. Write the **symbolic** notation for each description and illustration shown below.

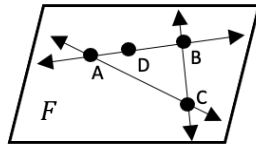
a. Line segment HQ



c. Line h containing points B and C .



e. Plane F



f. Line RK

2. **True or False.** Identify whether each sentence below is true or false.

- _____ A plane can be symbolized using 3 collinear points.
- _____ A point can be symbolized using a single capital letter.
- _____ A line segment is a set of points that extends infinitely (endlessly) in opposite directions.
- _____ A line segment contains two endpoints.
- _____ A line can be symbolized using a single lower-case letter.
- _____ Collinear points are points that do not lie on the same line.
- _____ \overleftrightarrow{AW} can also be expressed as \overleftrightarrow{WA} .
- _____ Three points are needed to describe a unique line.
- _____ Infinitely many lines can be drawn through a single point.

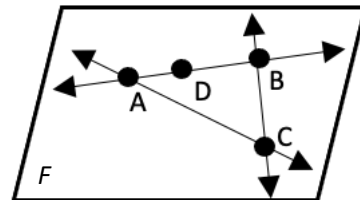
3. Consider the plane shown in question 1.

a. List all points, lines, and planes, written in symbolic notation.

Points: _____

Lines: _____

Planes: _____



b. Why can't we express "Plane F " as "Plane ADB "?