

I. UNDEFINED TERMS

OBJECTIVE

When you have completed this section, you should be able to:

1. Identify, draw, and label models of undefined terms.

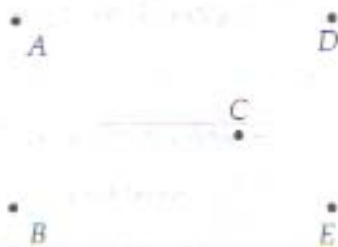
In geometry there are three terms that we do not attempt to define. They are *point*, *line*, and *plane*. These three terms are the foundation upon which geometry is built.

POINTS

A point cannot be seen. It has no size, no shape, no color, no physical properties. It is an imaginary thing. We do, however, represent a point on paper by a dot. A point has position or location.

To be able to talk about a point, we name it with a capital letter and show it on paper as a dot.

Five locations or positions on this page are points and are named *A*, *B*, *C*, *D*, and *E*. More than five points are on the page. In fact, the number of points on this page is infinite.



Complete these activities.

1.1 We think of a point as a _____

1.2 A point is represented by _____

1.3 Place names on these points.



1.4 How many points are located on this page? _____

1.5 What physical characteristics do points have? _____

1.6 Have you ever seen a point? _____

LINES

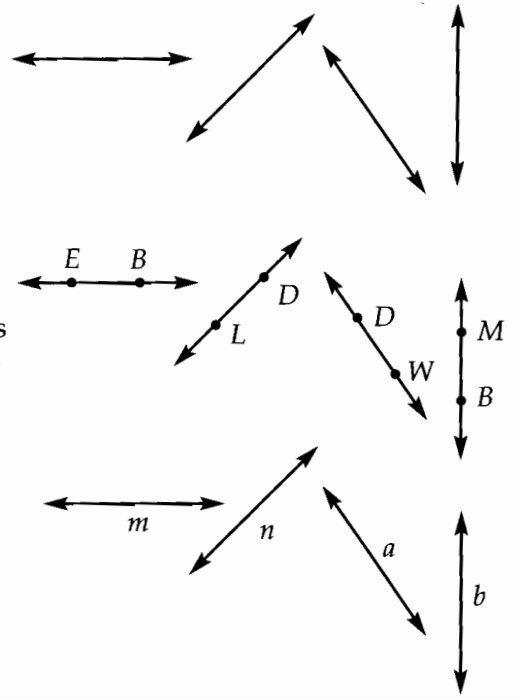
A line can be thought of as a collection of points that are lined up one after the other and extend infinitely far in opposite directions. A line in geometry is straight, not curved or bent.

We represent a line on paper like this:



The arrowheads on the ends tell us the line extends indefinitely. Since a line is made up of points, it has no thickness or other physical characteristics. A line is named by naming two of its points and placing a double-pointed arrow above the two letters.

To the right are four lines named \overleftrightarrow{EB} , \overleftrightarrow{LD} , \overleftrightarrow{DW} , and \overleftrightarrow{MB} . A line may also be named by using a single lower-case letter as illustrated.

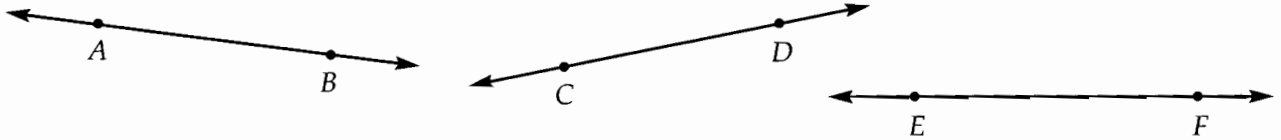


Supply the information required.

1.7 We think of a line as a collection of _____.

1.8 Unless otherwise indicated, a line in geometry is understood to be (straight, curved, either) _____.

1.9 Name the following lines.



a. _____ b. _____ c. _____

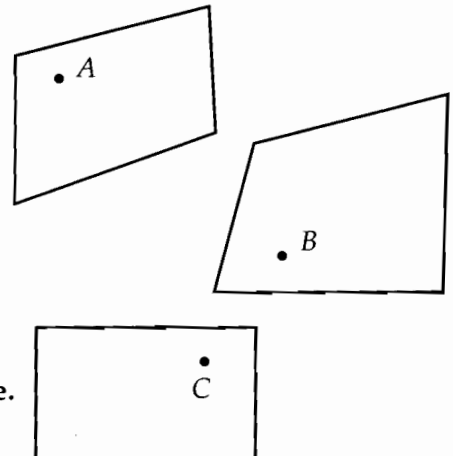
1.10 How many lines are contained on this page? _____

1.11 What is indicated by arrowheads on a line? _____

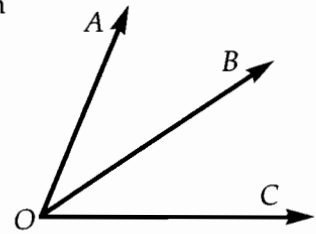
PLANES

A *plane* can be thought of as a collection of points in a flat surface that extends in all directions without stopping. To represent a plane, a figure is drawn like the ones illustrated. (Remember that the edges are not really there.) A plane is named by using the name of one of its points. Thus we have plane *A*, plane *B*, and plane *C*. As with points and lines, planes do not have any physical properties. A billion planes could be stacked in a pile and still not have enough thickness to be measured.

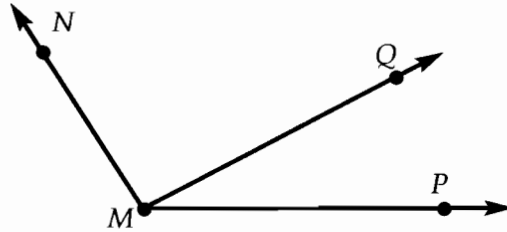
A plane is defined by at least three points not all on the same line.



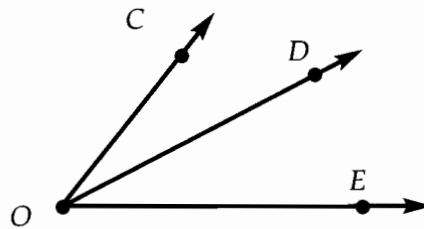
\vec{OB} is between \vec{OA} and \vec{OC} when all three rays have the same end point and when \vec{OB} lies in the interior of $\angle AOC$. Both of these conditions must be true for \vec{OB} to be between \vec{OA} and \vec{OC} .



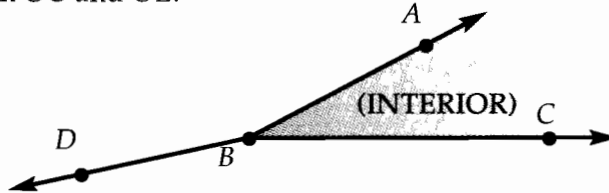
Models:



\vec{MQ} is between \vec{MN} and \vec{MP} .



\vec{OD} is between \vec{OC} and \vec{OE} .

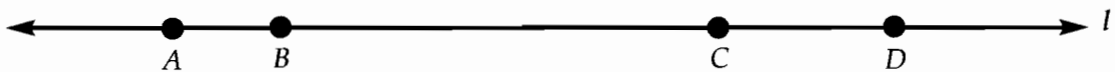


\vec{BD} is not between \vec{BA} and \vec{BC} .
It is not in the interior of $\angle ABC$.



Complete these activities.

- 1.13 a. Draw lines \perp to l through points $A, B, C,$ and D .



- b. What does inductive reasoning tell you about these lines?

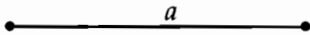


Review the material in this section in preparation for the Self Test. The Self Test will check your mastery of this particular section. The items missed on this Self Test will indicate specific areas where restudy is needed for mastery.

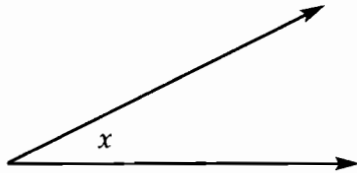
SELF TEST 1

Complete the following constructions. Leave all construction arcs on your paper (each construction, 5 points).

1.01 Construct segment $MN = 3a$.



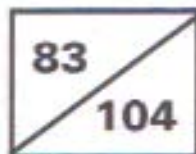
1.02 Construct an angle, $\angle ABC = 2x$.



1.03 Bisect \overline{AB} with \overleftrightarrow{CD} .



MATHEMATICS 1010: LIFE PAC TEST



Name _____
 Date _____
 Score _____

Write the letter for the best answer on the line (each answer, 2 points).

1. For any circle, π is exactly equal to _____ .
 a. $\frac{22}{7}$ b. 3.14 c. $\frac{c}{d}$ d. $\frac{d}{c}$
2. The line containing points (-1, 3) and (3, 8) has slope _____ .
 a. $\frac{5}{2}$ b. $\frac{5}{4}$ c. $\frac{2}{5}$ d. $\frac{4}{5}$
3. The midpoint of the segment joining points (a, b) and (j, k) is _____ .
 a. $(j - a, k - b)$ c. $(j + a, k + b)$
 b. $(\frac{j - a}{2}, \frac{k - b}{2})$ d. $(\frac{j + a}{2}, \frac{k + b}{2})$
4. The altitude of an equilateral triangle is $7\sqrt{3}$ units long.
 The length of one side of the triangle is _____ .
 a. 7 b. 14 c. $14\sqrt{3}$ d. $\frac{7\sqrt{3}}{2}$
5. The area of a square is 36. The length of the diagonal of the square is _____ .
 a. $36\sqrt{2}$ b. $6\sqrt{2}$ c. $3\sqrt{2}$ d. 6
6. The only defined term of those listed is _____ .
 a. line b. angle c. plane d. point
7. The intersection of two planes is a _____ .
 a. line b. segment c. point d. ray
8. Which of the following items can be measured? _____ .
 a. plane b. line c. ray d. segment
9. Ray \vec{OX} bisects $\angle AOC$ and $m\angle AOX = 42^\circ$. $m\angle AOC =$ _____ .
 a. 42° b. 84° c. 21° d. 68°
10. In triangle ABC , $m\angle A = 47^\circ$, $m\angle B = 62^\circ$, $m\angle C =$ _____ .
 a. 81° b. 61° c. 71° d. 51°