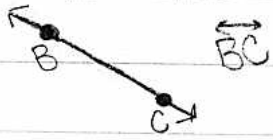
Geo 1

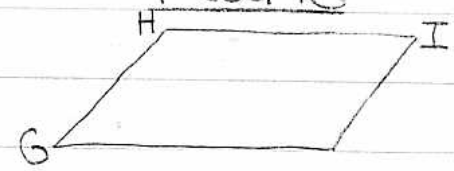
Points, Lines and Planes

Point

Line



Plane



A point has a position but no length, width or depth

A line is infinitely long (length) but has no width or depth.

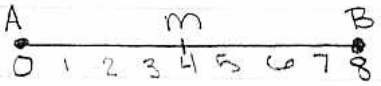
A plane has length and width but no depth

Line Segments and Rays

Line Segment -  denoted $\overline{AB}$

the part of a line from A to B.
A and B are called endpoints.

Midpoint - the exact middle of a line segment.

(ex)  m = midpoint

notice the distance from A to M is 4 and from M to B is 4.
we denote this $m(\overline{Am}) = 4 = m(\overline{mB})$
and call it the measure of $\overline{Am}$ & $\overline{mB}$
(book: use notation $Am = mB$ w/no $\overline{\ }$ for measure)

Congruent - 2 line segments are congruent, $\cong$,
if they have the same measure.

(ex) from above $\overline{Am} \cong \overline{mB}$ since $m(\overline{Am}) = m(\overline{mB})$

Ray - part of a line that begins at a point and continues forever in one direction.
 , A is the endpoint.

To name a ray we need another point on the ray, call it B.  , $\overrightarrow{AB}$ (also $\overrightarrow{\text{endpoint, point}}$)

Same ray can have multiple names

(ex) 

So could be called $\overrightarrow{HI}$ or $\overrightarrow{HJ}$

but not $\overrightarrow{IJ}$ or $\overrightarrow{IH}$ or $\overrightarrow{JH}$.

Summary

Line - goes on forever in both directions, $\overleftrightarrow{AB}$

Line Segment - stops at endpoints, $\overline{AB}$

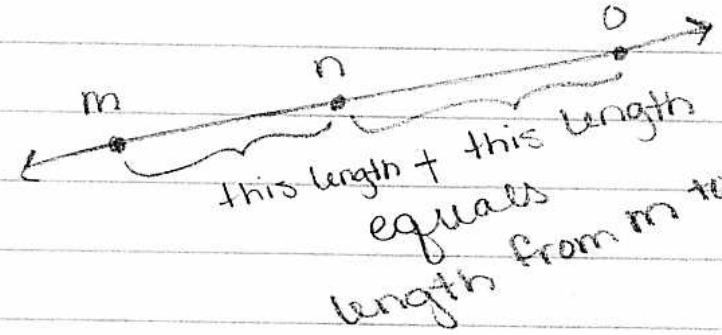
Ray - goes on forever in one direction, $\overrightarrow{AB}$

Segment Addition Postulate

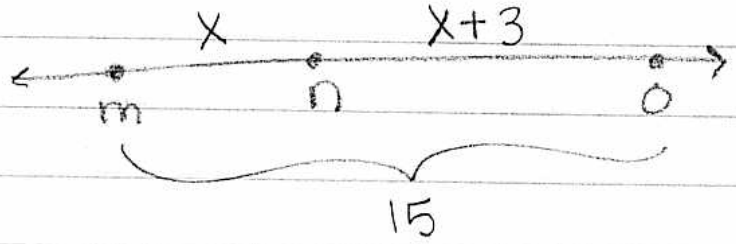
If M, N, and O are points on the same line, with N between M and O then

$$m(\overline{MO}) = m(\overline{MN}) + m(\overline{NO})$$

In pictures,



(ex.) find x.



$$x + (x+3) = 15$$
$$2x + 3 = 15$$
$$-3 \quad -3$$
$$\frac{2x}{2} = \frac{12}{2}$$
$$x = 6.$$