Definition 12

Segment If A and B are two points then the segment between them is the set of points $A - X - B$, for all X in S, along with A and B. It is written $\overline{AB}$

Definition 13

Ray Is the set of points C on $\overleftrightarrow{AB}$ with A not between B and C. It is written $\overrightarrow{AB}$.

Definition 14

Ray (alternate) Is the union of $\overline{AB}$ and the set of all points C such that $A - B - C$.

Definition 15

Angle Is the union of two rays with the same endpoint but don't lie on the same line. If the angle is the union of $\overrightarrow{BC}$ and $\overrightarrow{CD}$ then the rays are called the sides of the angle and C is the vertex. And the angle is denoted $\angle BCD$ or $\angle DCB$, the vertex is always in the middle. There will be times when we will refer to an angle as $\angle C$ if there is no confusion.

Definition 16

Triangle If A, B, C are three non-collinear points, then the set $\overline{AB} \cup \overline{BC} \cup \overline{CA}$ is a triangle.

The three segments $\overline{AB}, \overline{BC}, \overline{CA}$ are sides. And the vertices are A, B, C. The angles of $\triangle ABC$ are $\angle ABC$, $\angle BAC$ and $\angle ACB$.

***Theorem* 9** [3.5.T-1] If A and B are any two points then $\overline{AB} = \overline{BA}$.

***Theorem* 10** [3.5.T-2] If C is a point of $\overrightarrow{AB}$, other than A, then $\overrightarrow{AB} = \overrightarrow{AC}$

***Theorem* 11** [3.5.T-3] If $B_1 \in \overrightarrow{AB}$ and $C_1 \in \overrightarrow{AC}$, and neither are equal to A, then $\angle BAC = \angle B_1AC_1$

***Theorem* 12** [3.5.T-4] If $\overline{AB} = \overline{CD}$, then the points A,B are the same as the points C, D in some order.

***Theorem* 13** [3.5.T-5] If $\triangle ABC = \triangle DEF$, then the points A, B, C are the same as D, E, F in some order.

Definition 17 [Sidedness] Given points R,S and line k. R and S are on the same side of k if $\overline{RS} \cap k = \emptyset$. R and S are on opposite sides of k if $R \notin k$ and $S \notin k$ and $\overline{RS} \cap k \neq \emptyset$.

Definition 18

Interior Given $\angle ABC$ and a point P then P is in the interior of $\angle ABC$ if P and C are on the same side of $\overleftrightarrow{AB}$ and P and A are on the same side of $\overleftrightarrow{CB}$. It is written $int\angle ABC$.

Definition 19

Exterior Given $\angle ABC$ and a point P then P is in the exterior if $P \notin int\angle ABC$ or $P \notin \angle ABC$.

Definition 20

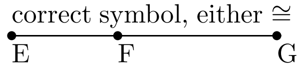
Interior of a triangle Given $\triangle DEF$ then $int\triangle DEF = int\angle DEF \cap int\angle EDF$ (or in general it is the intersection of the interior of any two angles of the triangle.

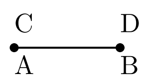
Definition 21

Congruence of line segments If $AB = DC$ then $\overline{AB} \cong \overline{CD}$.

Homework 4

1. Given $\overleftrightarrow{EC}$ and $\overleftrightarrow{FB}$ with $E - A - C$ and $F - A - B$, list all of the line segments, rays and lines.
2. Given that $AB = EF$ insert the correct symbol, either $\cong$ or $=$ or both.





   (a) $AB?CD$
   (b) $\overline{AB}?\overline{CD}$
   (c) $CD?EF$
   (d) $\overline{CD}?\overline{EF}$
   (e) $CD?EG$
   (f) $\overline{AB}?\overline{EG}$
3. Let A and B be two points, and let D, E, F be three non-collinear points. If $\overleftrightarrow{AB}$ contains only one of the points D, E or F then each of the lines $\overleftrightarrow{DE}$, $\overleftrightarrow{DF}$, $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ in at most one point.
4. Show that for any $\triangle ABC$, we have $\overleftrightarrow{AB} \cap \triangle ABC = \overline{AB}$.
5. Show that A is not between any two points of $\triangle ABC$