

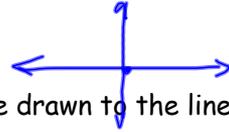
Geometry Congruence of line segments, angles and triangles

Notes 4-1: Postulates of lines, line segments and angles

4.2: Through two given points one and only one line can be drawn.

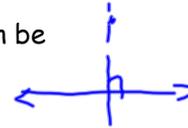


4.3: Two lines cannot intersect in more than one point.



4.5: At a given point on a given line, one and only one perpendicular can be drawn to the line.

4.6: From a given point not on a given line, one and only one perpendicular can be drawn to the line



4.8: The shortest distance between two points is the length of the line segment joining these two points.

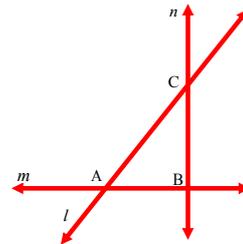
4.9: A line segment has one and only one midpoint.

4.10: An angle has one and only one bisector.

Ex 1:

a. What is the intersection of m and n? **B**

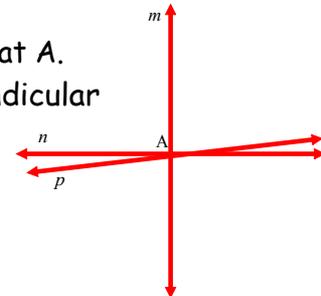
b. Do points A and B determine line m, n or l? **m**



Ex 2: Line p and n are two different lines that intersect line m at A.

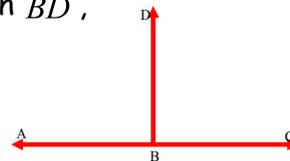
If line n is perpendicular to line m, can line p be perpendicular to line m?

no, because there is only 1 line \perp to a given line



Ex 3: If \overline{BD} bisects $\angle ABC$ and point E is not a point on \overline{BD} , can \overline{BE} be the bisector of $\angle ABC$

no, an angle only has 1 bisector.



Conditional statements: The information that is known to be true is often stated as the given, and what is to be proved as prove. When the information needed for a proof is presented as a conditional, we use the hypothesis to form the given statement, and the conclusion to form the prove statement.

Ex. 4 Rewrite the conditional statement in the given and prove format.

a. If a ray bisects a straight angle, it is perpendicular to the line determined by the straight angle.

given: a ray bisects a straight angle
 Prove: the ray is \perp to the line determined by the straight angle.

b. If $AB=CD$ and $DC=AD$, then $AB=DC$.

given: $AB=CD$, $DC=AD$
 Prove: $AB=DC$

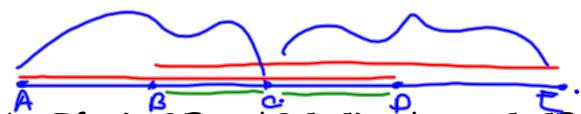
Ex. 5 Rewrite the conditional statement in the given and prove format. Then write a formal proof.

a. If $m\angle 1 + m\angle 2 = 90$ and $m\angle A = m\angle 2$, then $m\angle 1 + m\angle A = 90$.

Given: $m\angle 1 + m\angle 2 = 90$
 $m\angle A = m\angle 2$

Prove: $m\angle 1 + m\angle A = 90$

Statement	Reason
1. $m\angle 1 + m\angle 2 = 90$	1. given
2. $m\angle A = m\angle 2$	2. given
3. $m\angle 1 + m\angle A = 90$	3. A quantity may be substituted for its equal in any statement of equality.



b. If $AD=BE$ and $BC=CD$, then $AC=CE$.

Given: $AD=BE$
 $BC=CD$

Prove: $AC=CE$

1) $AD=BE$	1. given
2) $BC=CD$	2. given
3) $AD-CD=BE-BC$	3. If equals are subtracted from equals the differences are =
4) $AC=CE$	4. A quantity may be substituted for its equal in any statement of equality.

* Substitution follows \perp or $=$