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## **Definitions:**

A plane is a two dimensional geometric object. It has infinite length and infinite width but no thickness.

**Parallel lines** are lines that lie in the same plane but do not intersect. (Symbol ||)

**Perpendicular lines** are two lines that meet to form congruent adjacent angles. (Symbol  $\perp$ )

3. $m \angle AEC \equiv m \angle CEB$ 3. $measures are \underline{are}$ 4. $\angle AEB$ is a straight angle4. $\leq traight angles$ measure 1805. $m \angle AEC + m \angle CEB = \angle AEB$ 5. $Angle addition postulate$ 6. $m \angle AEC + m \angle CEB = 180^{\circ}$ 6. $\leq ubs titution$ 7. $m \angle AEC + m \angle AEC = 180^{\circ}$ or $2(m \angle AEC) = 180^{\circ}$ 7. $\leq ubs titution$ 8. $m \angle AEC = 90^{\circ}$ 8. $Division$	<b>Theorem1.6.1:</b> If two lines are perpendicular	, then they meet to form <u>right angles</u> .
Prove: $\angle AEC$ is a right angleReasonsStatementsReasons1. $\overline{AB} \perp \overline{CD}$ intersecting at E.1. Give n2. $\angle AEC \cong \angle CEB$ 2. Peopen di culler times meet to form $\cong$ angles3. $m\angle AEC \cong m\angle CEB$ 3. mcasures are $\cong$ 4. $\angle AEB$ is a straight angle4. $\leq$ traigut angles measure (for $\leq$ m $\angle AEC + m\angle CEB = \angle AEB$ 5. $m\angle AEC + m\angle CEB = 180^{\circ}$ 6. $\leq$ ubs titution7. $m\angle AEC + m\angle AEC = 180^{\circ}$ 7. $\leq$ ubs titution8. $m\angle AEC = 90^{\circ}$ 8. $Division$	Given: $\overrightarrow{AB} \perp \overrightarrow{CD}$ intersecting at E.	
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	$2(m \angle AEC) = 180^{\circ}$	7. substitution
$0  \Delta EC$ is a right angle $0  \nabla c \int c \nabla d = 0$	8. m $\angle AEC = 90^{\circ}$	8. $Division$
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Table 1.8		
Relation	<b>Object Related</b>	Example
Is equal to	numbers	2 + 3 = 5
Is greater than	numbers	7 > 5
Is perpendicular to	lines	$n\perp m$
Is complementary to	angles	$\angle 1$ is comp to $\angle 2$
Is congruent to	line segments	$\overline{AB} \equiv \overline{CD}$
Is a brother	people	Mike is brother of Tom

**Properties:** 

Relate

**Reflexive property:** aRa  $(5 = 5, \text{ equality of numbers has a reflexive property).$ 

Symmetric property: If aRb, then bRa. (If  $n \perp m$ , then  $m \perp n$ , perpendicular lines have the symmetric property).  $\langle 2 \langle 3 \rangle$  Frue  $3 \langle 2 \rangle$  fake  $\langle 1 \rangle$  symmetric **Transitive property:** If aRb and bRc, then aRc, (If  $m \angle 1 \equiv m \angle 2$  and  $m \angle 2 \equiv m \angle 3$ , then  $m \angle 1 \equiv m \angle 3$ , congruence of angle is transitive).

Example 2: Given the line segment A = B = C = Da. An example of reflexive property: AB = AB / BC = BC / CD = CDb. An example of the transitive property: suppose AB = CD = CD = DEc. An example of the symmetric property: AB = BA Example 3: Given:  $\angle ABC$  and  $\angle CBD$  are complementary,  $\angle CBD$  and  $\angle DBE$  are complements.

