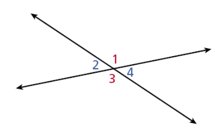
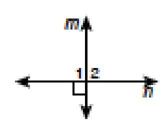
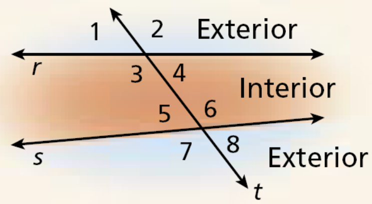
Name:____ Period:________

Unit 1 Helpful Tools for Proofs

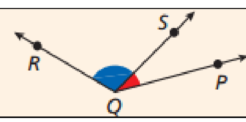
Definitions

Name	Definition	Example
Congruent Segments (1.2)	Segment that have the same length	$\overline{AB} \cong \overline{CD}$ ↔ AB=CD
Midpoint (1.2)	The point that divides the segment into two congruent segments.	M is the midpoint of $\overline{AB}$ ↔ $\overline{AM} \cong \overline{MB}$
Right Angle (1.3)	Measures 90°	∠1 is a right angle↔ $m\angle 1 = 90°$
Straight Angle (1.3)	Formed by two opposite rays and measures 180°.	∠1 is a straight angle↔ $m\angle 1 = 180°$
Congruent Angles (1.3)	Angles that have the same measure	$\angle ABC \cong \angle DEF \leftrightarrow m\angle ABC = m\angle DEF$
Angle Bisector (1.3)	A ray that divides an angle into two congruent angles.	$\overrightarrow{JK}$ bisects $\angle LJM \leftrightarrow \angle LJK \cong \angle KJM$
Linear Pair (1.4)	Adjacent angles whose noncommon sides are opposite rays.	$\angle ABC$ and $\angle CBD$ are a linear pair → $\overrightarrow{BA}$ *and* $\overrightarrow{BD}$ are opposite rays
Complementary Angles (1.4)	Two angles whose measures have a sum of 90°.	∠A and ∠B are complementary ↔ m∠A +m∠B=90°
Supplementary Angles (1.4)	Two angles whose measures have a sum of 180°	∠A and ∠B are supplementary↔ m∠A +m∠B=180°
Vertical Angles (1.4)	Two non adjacent angles formed by two intersecting lines.	 ∠1&∠3 are vertical angles. ∠2&∠4 are vertical angles.
Perpendicular Lines (3.1)	Lines that intersect at 90° angles	m⊥n ↔ $m\angle 1 = 90°$ *and* $m\angle 2 = 90°$ 

Angle Pairs Formed by a Transversal

TERM	EXAMPLE
A **transversal** is a line that intersects two coplanar lines at two different points. The transversal *t* and the other two lines *r* and *s* form eight angles.	
Corresponding angles lie on the same side of the transversal *t*, on the same sides of lines *r* and *s*.	$\angle 1$ and $\angle 5$
Alternate interior angles are nonadjacent angles that lie on opposite sides of the transversal *t*, between lines *r* and *s*.	$\angle 3$ and $\angle 6$
Alternate exterior angles lie on opposite sides of the transversal *t*, outside lines *r* and *s*.	$\angle 1$ and $\angle 8$
Same-side interior angles or *consecutive interior angles* lie on the same side of the transversal *t*, between lines *r* and *s*.	$\angle 3$ and $\angle 5$

Postulates

Name	Explanation
Segment Addition Postulate (1.2)	If B is between A and C, then $AB + BC = AC$. 
Angle Addition Postulate (1.3)	If S is in the interior of $\angle PQR$, then $m\angle PQS + m\angle SQR = m\angle PQR$. ($\angle$ Add. Post.) 
Corresponding Angles Postulate (3.2)	If two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.
Converse of the Corresponding Angles Postulate (3.3)	If two coplanar lines are cut by a transversal so that a pair of corresponding angles are congruent, then the two lines are parallel.

Properties (2.5)

Addition Property of Equality	If a=b, then a+c=b+c.
Subtraction Property of Equality	If a=b, then a-c=b-c.
Multiplication Property of Equality	If a=b, then ac=bc
Division Property of Equality	If a=b and c≠0, then a/c=b/c
Reflexive Property of Equality	a=a
Symmetric Property of Equality	If a=b, then b=a
Transitive Property of Equality	If a=b and b=c, then a=c
Substitution Property of Equality	If a=b, then b can be substituted for a in any expression.
Reflexive Property of Congruence	Figure A≅ Figure B
Symmetric Property of Congruence	If Figure A ≅ Figure B, then Figure B ≅ Figure A
Transitive Property of Congruence	If Figure A ≅ Figure B and Figure B≅Figure C, then Figure A ≅ Figure C.

Theorems

Alternate Interior Angles Theorem (3.2)	If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are congruent.
Alternate Exterior Angles Theorem (3.2)	If two parallel lines are cut by a transversal, then the two pairs of alternate exterior angles are congruent.
Same-Side Interior Angles Theorem (3.2)	If two parallel lines are cut by a transversal, then the two pairs of same-side interior angles are supplementary.
Converse of the Alternate Interior Angles Theorem (3.3)	If two coplanar lines are cut by a transversal so that a pair of alternate interior angles are congruent, then the two lines are parallel.
Converse of the Alternate Exterior Angles Theorem (3.3)	If two coplanar lines are cut by a transversal so that a pair of alternate exterior angles are congruent, then the two lines are parallel.
Converse of the Same-Side Interior Angles Theorem (3.3)	If two coplanar lines are cut by a transversal so that a pair of same-side interior angles are supplementary, then the two lines are parallel.
Perpendicular Transversal Theorem (3.4)	In a plane, if a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other line.
Perpendicular Bisector Theorem (5.1)	If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.
Converse of the Perpendicular Bisector Theorem (5.1)	If a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment.
Angle Bisector Theorem (5.1)	If a point is on the bisector of an angle, then it is equidistant from the sides of the angle.
Converse of the Angle Bisector Theorem (5.1)	If a point in the interior of an angle is equidistant from the sides of the angle, then it is on the bisector of the angle.
Linear Pair Theorem (2.6)	If two angles form a linear pair, then they are supplementary.
Congruent Supplements Theorem (2.6)	If two angles are supplementary to the same angle (or to two congruent angles), then the two angles are congruent.
Right Angle Congruence Theorem (2.6)	All right angles are congruent.
Congruent Complements Theorem (2.6)	If two angles are complementary to the same angle (or to two congruent angles), then the two angles are congruent.
