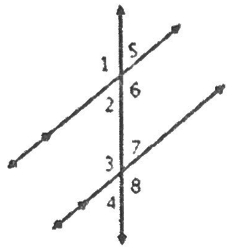
Topic #1 Parallel Lines Cut by Transversals

Use the diagram below to classify each pair of angles.



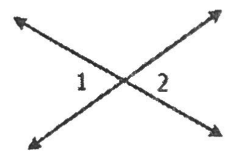
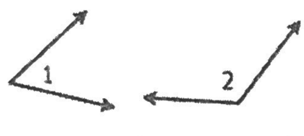
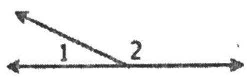
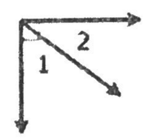
a. ∠1 and ∠3 Corresponding ∠'s

b. ∠5 and ∠4 alternate exterior ∠'s

c. ∠6 and ∠7 Same side int (consecutive interior)

d. ∠3 and ∠6 alternate interior ∠'s

Topic #2 Angle Relationships

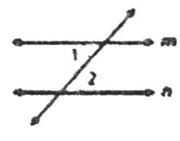
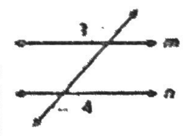
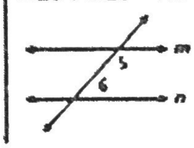
Classify the relationship between angles 1 and 2.			
	 $m\angle 1 = 68°$; $m\angle 2 = 112°$		
Vertical	Supplementary	linear pair	complementary

Topic #3 Properties and Reasons for Proofs

Property of Equality	Example
Reflexive Property of Equality	$X = X$ | $2 = 2$
Symmetric Property of Equality	$2 = x \rightarrow x = 2$
Transitive Property of Equality	$A = B$, $B = C \rightarrow A = C$
Addition Property of equality	$x - 2 = 10$, $x = 12$
Subtraction Property of Equality	$x + 2 = 10$, $x = 8$
Multiplication Property of Equality	$\frac{x}{2} = 10 \rightarrow x = 20$
Division property of Equality	$2x = 10$ → $x = 5$
Substitution property of equality	$2x = 10 + 7x$, $x = 1$
Distributive Property	$2(x+7) = 10$, $2x + 14 = 10$

Topic #4 Proving Lines Parallel

Theorems Proving Lines Parallel

	THEOREM	HYPOTHESIS	CONCLUSION
3-3-3	Converse of the Alternate Interior Angles Theorem. 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	$\angle 1 \cong \angle 2$ 	$m \parallel n$ by the converse of alt. int. ∠'s
3-3-4	Converse of the Alternate Exterior Angles Theorem. 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	$\angle 3 \cong \angle 4$ 	$m \parallel n$
3-3-5	Converse of the Same-Side Interior Angles Theorem. 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	$m\angle 5 + m\angle 6 = 180°$ 	$m \parallel n$

Conditional $p \to q$	**Read as:** if p then q

Related Conditionals

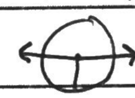
Inverse	**Converse**	**Contrapositive**
$\sim p \to \sim q$	$q \to p$	$\sim q \to \sim p$

Use the following statements to write conditional statements. Determine the truth value.

p: a line is tangent to a circle; q: it is perpendicular to the radius

Conditional: If a line is tangent to a circle, then it is perpendicular to the radius Truth Value: T

Inverse: If a line is not tangent to a circle, then it is not perpendicular to the radius Truth Value: F

Converse: If a line is perpendicular to the radius then it is tangent to a circle.  Truth Value: F

Contrapositive: If a line is not perpendicular to the radius, then it is not tangent to the circle. Truth Value: T

Bi-Conditional $p \leftrightarrow q$	**Read as:** p if and only if q **True when both conditional ($p \to q$) and converse ($q \to p$) are true!**

Write the conditional and converse of each statement below, then determine the true value of the bi-conditional.

It is Halloween if and only if it is October. **Truth Value:** F

Conditional: If it is halloween then it is October.

Converse: If it is october, then it is Halloween.