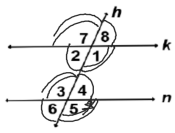
Geometry Notes Section 3-2

Angles Formed by Parallel Lines and Transversals

Oct 15

Postulates and Theorems about Angles Formed by Parallel Lines and Transversals

Corresponding Angles Postulate If two parallel lines are cut by a transversal, then corresponding angles are congruent.	If k‖n, then ∠1≅∠5, ∠2≅∠6 ∠8≅∠4, ∠7≅∠3
Alternate Interior Angles Theorem If two parallel lines are cut by a transversal, then alternate interior angles are congruent.	If k‖n, then ∠2≅∠4 and ∠1≅∠3.
Alternate Exterior Angles Theorem If two parallel lines are cut by a transversal, then alternate exterior angles are congruent.	If k‖n, then ∠7≅∠5 and ∠8≅∠6.
Same-side Interior Angles Theorem If two parallel lines are cut by a transversal, then same-side interior angles are supplementary.	if k‖n, then m∠1+m∠4=180 and m∠2+m∠3=180

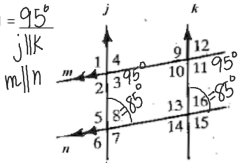


j k

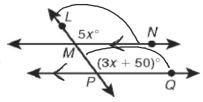
Examples:

1. If m∠8 = 85, m∠3 = 95, m∠16 = 85, m∠11 = 95°
~~and m∠11 =~~ _____.

j ‖ k
m ‖ n



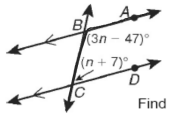
2.



Find m∠MPQ.

5x = 3x + 50
⋮
x = 25

3.

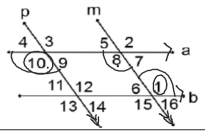


Find m∠ABC.

118°

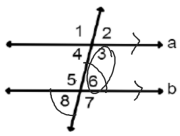
3n − 47 + n + 7 = 180
4n − 40 = 180
4n = 220
n = 55

4. Given: $a \parallel b$, $p \parallel m$
Prove: ∠1 ≅ ∠10



Statements	Reasons
① a‖b, p‖m	① given
② ∠1 ≅ ∠8	② if lines ‖, alt. int ∠s ≅
③ ∠8 ≅ ∠10	③ if lines ‖, corr. ∠s ≅
④ ∠1 ≅ ∠10	④ transitive

5. Given: $a \parallel b$
Prove: m∠3 + m∠8 = 180



Statements	Reasons
① a‖b	① Given
② m∠3 + m∠6 = 180	② if lines ‖, same-side int. ∠s supp.
③ m∠6 = m∠8	③ vertical ∠s are ≅
④ m∠3 + m∠8 = 180	④ Substitution