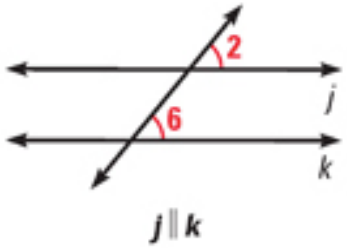
Geometry

Notes Section 3.3

Prove Lines are Parallel

POSTULATES / THEOREMS / COROLLARIES

Postulate 16: if



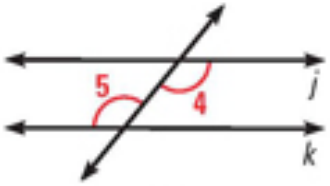
$j \parallel k$

,then the lines are PARALLEL

Corresponding Angle

Corresponding

Theorem 3-4: if

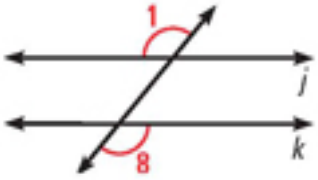


$j \parallel k$

,then the lines are PARALLEL

Alternate Interior Angle

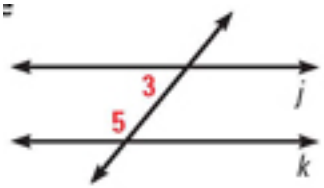
Theorem 3-5: if



$j \parallel k$

then the lines are PARALLEL

Alternate Exterior Angles



Theorem 3-6: if

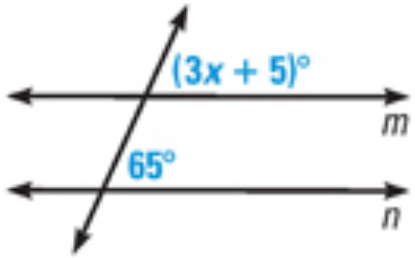
If $\angle 3$ and $\angle 5$ are supplementary, then $j \parallel k$.

,then the lines are PARALLEL

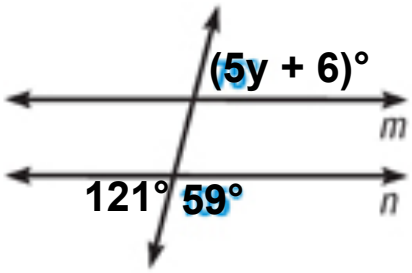
Consecutive Interior Angles

EXAMPLE 1 Find the value of x that makes m // n.

a)

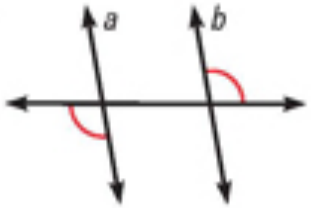


b)

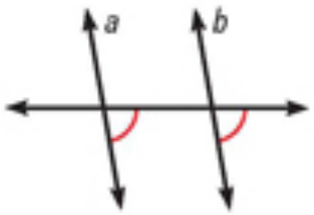


EXAMPLE 2 Can you prove that the lines are // ? Explain.

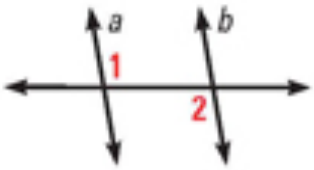
a)



b)



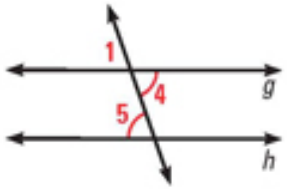
c) $m\angle 1 + m\angle 2 = 180°$



EXAMPLE 3 Complete the following proofs.

a) Given: $\angle 4 \cong \angle 5$

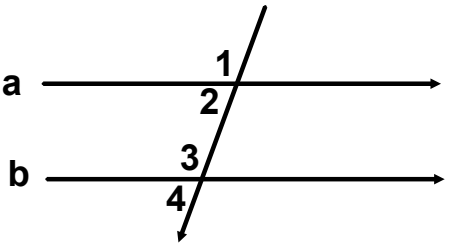
Prove: $g \parallel h$



1. $\angle 4 \cong \angle 5$	1. _____
2. $\angle 1 \cong \angle 4$	2. _____
3. $\angle 1 \cong \angle 5$	3. _____
4. $g \parallel h$	4. _____

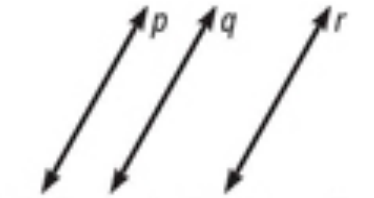
b) Given: $\angle 1$ and $\angle 4$ are supplementary

Prove: $a \parallel b$



1. $\angle 1$ and $\angle 4$ are supplementary	1. _____
2. $m\angle 1 + m\angle 4 = 180^\circ$	2. _____
3. $m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 3 + m\angle 4 = 180^\circ$	3. _____
4. $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 = 360^\circ$	4. _____
5. $m\angle 1 + m\angle 4 + m\angle 2 + m\angle 3 = 360^\circ$	5. _____
6. $180^\circ + m\angle 2 + m\angle 3 = 360^\circ$	6. _____
7. $m\angle 2 + m\angle 3 = 180^\circ$	7. _____
8. $a \parallel b$	8. _____

Theorem 3-7: If 2 lines are parallel to the same line, then they are parallel to each other.



EXAMPLE 4 The flag of the United States has 13 alternating red and white stripes. Each stripe is parallel to the stripe immediately below it. Explain why the top stripe is parallel to the bottom stripe.