

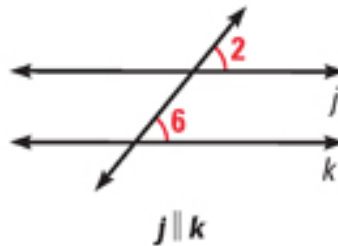
Honors Geometry

Notes Section 3.3

Prove Lines are Parallel

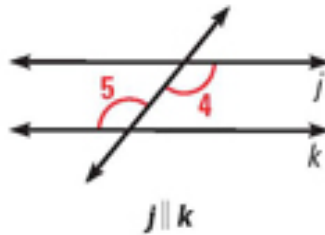
POSTULATES / THEOREMS / COROLLARIES

Postulate 16: if
Corresponding Angle:



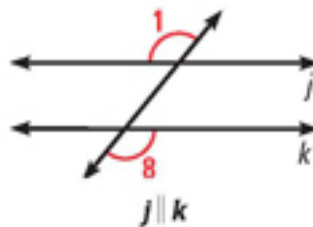
then the lines are **PARALLEL**

Theorem 3-4: if
Alternate Interior Angle



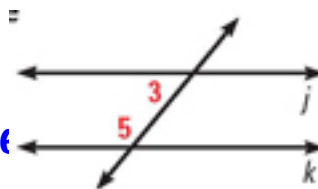
then the lines are **PARALLEL**

Theorem 3-5: if
Alternate Exterior Angle



then the lines are **PARALLEL**

Theorem 3-6: if
Consecutive Interior Angle

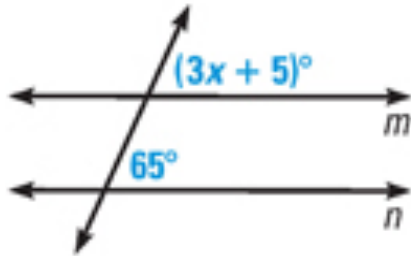


If $\angle 3$ and $\angle 5$ are supplementary, then $j \parallel k$.

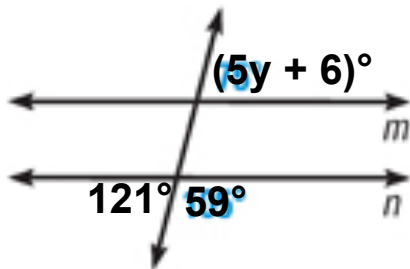
then the lines are **PARALLEL**

EXAMPLE 1 Find the value of x that makes $m \parallel n$.

a)

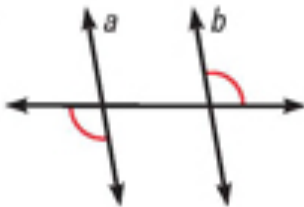


b)

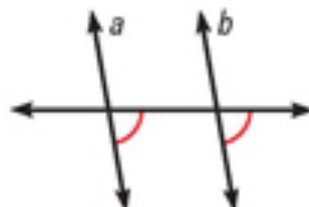


EXAMPLE 2 Can you prove that the lines are \parallel ? Explain.

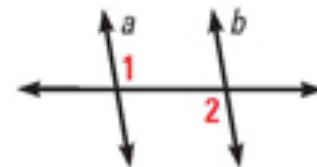
a)



b)



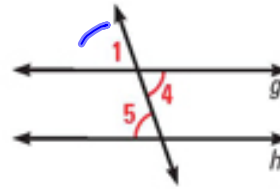
c) $m\angle 1 + m\angle 2 = 180^\circ$



EXAMPLE 3 Complete the following proofs.

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

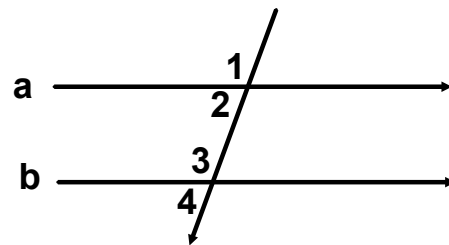
Prove: $g \parallel h$



- | | |
|------------------------------|----------|
| 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. _____ |

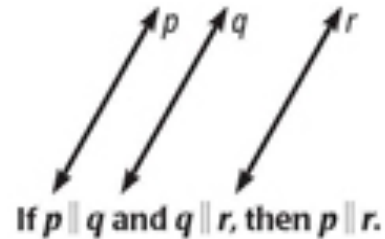
b) **Given:** $\angle 1$ and $\angle 4$ are supplementary

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.

