

Proving Lines Parallel

1. Complete each conditional statement below by filling in the blank.

- a) If the lines are parallel, then the alternate interior angles are \cong .
- b) If the lines are parallel, then the alternate exterior angles are \cong .
- c) If the lines are parallel, then the corresponding angles are \cong .
- d) If the lines are parallel, then the consecutive interior angles are Supplementary.

2. Write the converse statement for each conditional statement above.

The converse is created by switching the IF and THEN parts of the conditional statement.

- a) If the alternate interior angles are \cong , then the lines are parallel.
- b) If ALT INT \angle s \cong , THEN lines \parallel
- c) If corresponding \angle s \cong , THEN lines \parallel
- d) If consec int \angle s supplementary, THEN lines \parallel

3. Use the figure to fill in the angles that would satisfy the statement.

a) Using the Alternate Interior Angles Converse

$\angle 3 \cong \angle 5$
If $\angle 4 \cong \angle 6$, then $r \parallel s$.

b) Using the Alternate Exterior Angles Converse

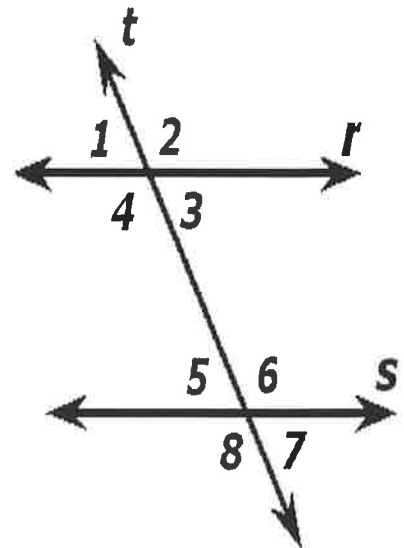
$\angle 2 \cong \angle 8$
If $\angle 1 \cong \angle 7$, then $r \parallel s$.

c) Using the Consecutive Interior Angles Converse

$\angle 3 + \angle 6$ are supp
If $\angle 4 + \angle 5$ are supp, then $r \parallel s$.

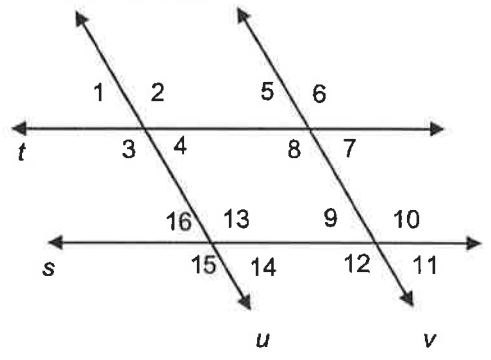
d) Using the Corresponding Angles Converse

If $\angle 1 \cong \angle 5$, then $r \parallel s$.
 $\angle 4 \cong \angle 8$
 $\angle 2 \cong \angle 6$
 $\angle 3 \cong \angle 7$



Using the figure to the right, determine which lines are parallel. Choose the reason from the postulates and theorems given. If no parallel lines, then **only** fill in the reason.

- A. If \parallel then same side angles are supplementary.
- B. If \parallel then alternate interior angles are congruent.
- C. If \parallel then corresponding angles are congruent.
- D. If same side interior angles are supplementary then \parallel .
- E. If corresponding angles are congruent then \parallel .
- F. If alternate interior angles are congruent then \parallel .
- G. No lines \parallel .



1. $\angle 3 \cong \angle 13$
2. $\angle 3 \cong \angle 7$
3. $\angle 13$ is supplementary to $\angle 16$
4. $\angle 4$ is supplementary to $\angle 8$
5. $\angle 9 \cong \angle 16$
6. $\angle 8 \cong \angle 13$
7. $\angle 6 \cong \angle 10$
8. $\angle 4 \cong \angle 16$
9. $\angle 4 \cong \angle 5$
10. $\angle 1 \cong \angle 16$

- t \parallel s because F
- \parallel because G
- \parallel because G
- u \parallel v because D
- u \parallel v because E
- \parallel because G
- t \parallel s because E
- t \parallel s because F
- u \parallel v because F
- t \parallel s because E

Find the value of x that makes $m \parallel n$. State the theorem you used.

