**Activity 2.5.5 Proving Angle Relationships**

In these proofs you may use these postulates and theorems:

**Parallel Lines Corresponding Angles Theorem
 (Parallel lines 🡪 Corresponding Angles Congruent)**

**Vertical Angles Theorem**

**Linear Pair Postulate**

**Transitive property**

**Substitution property**

1. In the figure at the right:
2. $∠2$ and $∠3$ are a pair of \_\_\_\_\_\_\_\_\_\_\_\_\_ angles
3. $∠1$ and $∠3$ are a pair of \_\_\_\_\_\_\_\_\_\_\_\_\_ angles
4. Given: *m* || *n*

Prove: m$∠1$ = m$∠2$

d. State the results of this proof as a theorem: If two parallel lines are intersected by a transversal, then pairs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. In the figure at the right:
2. $∠1$ and $∠4$ are a pair of \_\_\_\_\_\_\_\_\_\_\_ angles
3. $∠1$ and $∠3$ are a pair of \_\_\_\_\_\_\_\_\_\_\_ angles
4. Given: *m* || *n*

Prove: m$∠3$ = m$∠4$

d. State the results of this proof as a theorem: If two parallel lines are intersected by a transversal, then pairs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. In the figure at the right

a. $∠5$ and $∠3$ are a \_\_\_\_\_\_\_\_\_\_\_ pair of angles.

b. $∠1$ and $∠3$ are a pair of \_\_\_\_\_\_\_\_\_\_ angles.

c. Given: *m* || *n*

 Prove: m$∠1$ + m$∠5$ = 180°

1. State the results of this proof as a theorem: If two parallel lines are intersected by a transversal, then pairs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. In the figure at the right

a. $∠6$ and $∠1$ are a \_\_\_\_\_\_\_\_\_\_\_ pair of angles.

b. $∠1$ and $∠3$ are a pair of \_\_\_\_\_\_\_\_\_\_ angles.

c. Given: *m* || *n*

 Prove: m$∠6$ + m$∠3$ = 180°

d. State the results of this proof as a theorem: If two parallel lines are intersected by a transversal, then pairs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.