

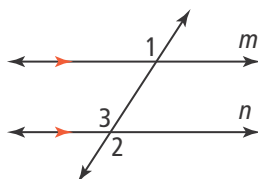


**UNDERSTAND**

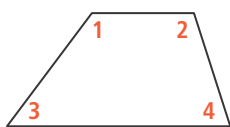
10. **Construct Arguments** Write a two-column proof of the Alternate Exterior Angles Theorem.

**Given:**  $m \parallel n$

**Prove:**  $\angle 1 \cong \angle 2$



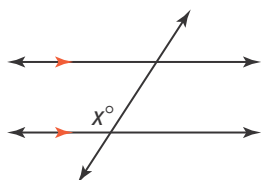
11. **Higher Order Thinking** Using what you know about angle pairs formed by parallel lines and a transversal, how are  $\angle 1$ ,  $\angle 2$ ,  $\angle 3$ , and  $\angle 4$  related in the trapezoid? Explain.



12. **Error Analysis** What error did Tyler make?

$m\angle 1 = 72$  by Same-Side Exterior Angles Theorem **X**

13. **Generalize** In the diagram shown, if  $x + y = 180$ , label the remaining angles as  $x^\circ$  or  $y^\circ$ .

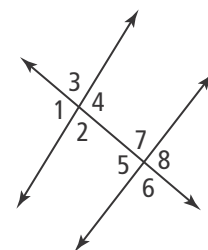


14. **Mathematical Connections** A transversal intersects two parallel lines. The measures of a pair of alternate interior angles are  $5v$  and  $2w$ . The measures of a pair of same-side exterior angles are  $10w$  and  $5v$ . What are the values of  $w$  and  $v$ ?

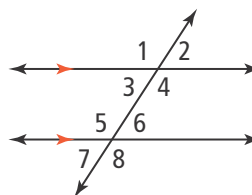
**PRACTICE**

Identify a pair of angles for each type. SEE EXAMPLE 1

- 15. same-side interior
- 16. corresponding
- 17. alternate exterior

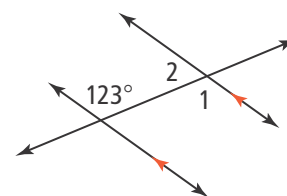


18. Which angles are supplementary to  $\angle 1$ ? Which are congruent to  $\angle 1$ ? SEE EXAMPLE 2



Find each angle measure. SEE EXAMPLE 3

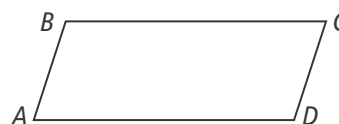
- 19.  $m\angle 1$
- 20.  $m\angle 2$



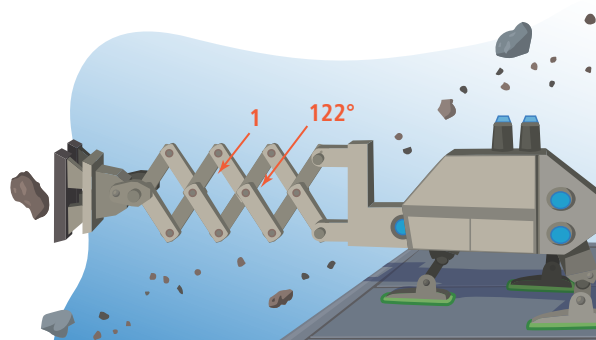
21. Opposite sides of a parallelogram are parallel. Prove that opposite angles of a parallelogram are congruent. SEE EXAMPLE 4

**Given:**  $ABCD$  is a parallelogram

**Prove:**  $\angle A \cong \angle C$ ,  $\angle B \cong \angle D$

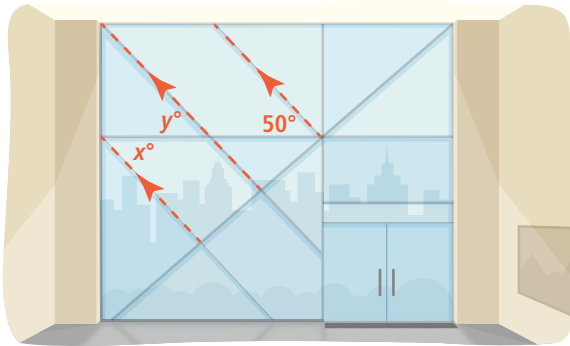


22. Three parallelograms are hinged at each vertex to create an arm that can extend and collapse for an exploratory spaceship robot. What is  $m\angle 1$ ? Explain how you found the answer. SEE EXAMPLE 5

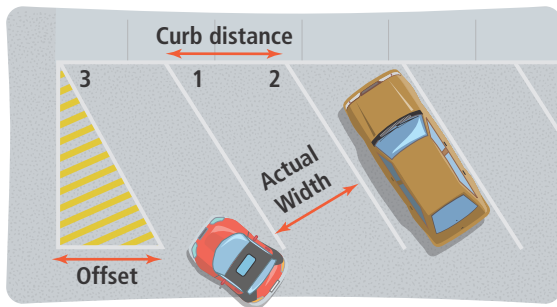


**APPLY**

**23. Model With Mathematics** A glazier is setting supports in parallel segments to prevent glass breakage during storms. What are the values of  $x$  and  $y$ ? Justify your conclusions.



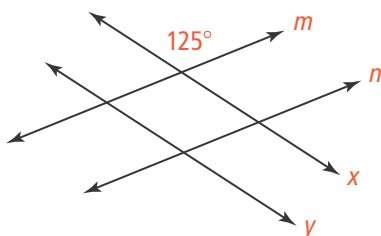
**24. Reason** In the parking lot shown, all of the lines for the parking spaces should be parallel. If  $m\angle 3 = 61$ , what should  $m\angle 1$  and  $m\angle 2$  be? Explain.



**25. Communicate Precisely** Margaret is in a boat traveling due west. She turned the boat  $50^\circ$  north of due west for a couple of minutes to get around a peninsula. Then she resumed due west again.

- How many degrees would she turn the wheel to resume a due west course?
- Name the pair of angles she used. Are the angles congruent or supplementary?

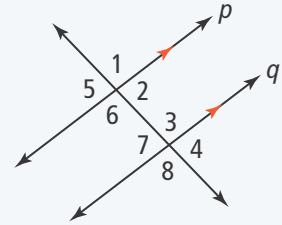
**26.** Parallel lines  $m$  and  $n$  intersect parallel lines  $x$  and  $y$ , representing two sets of intersecting railroad tracks. At what angles do the tracks intersect?



**ASSESSMENT PRACTICE**

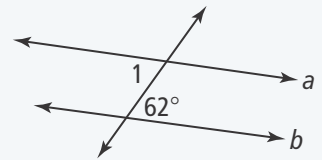
**27** Classify each angle as congruent to  $\angle 1$  or congruent to  $\angle 2$ .

- $\angle 3$     $\angle 4$
- $\angle 5$     $\angle 6$
- $\angle 7$     $\angle 8$



**28. SAT/ACT** In the diagram,  $a \parallel b$ . What is  $m\angle 1$ ?

- (A) 28
- (B) 62
- (C) 90
- (D) 118



**29. Performance Task** Students on a scavenger hunt are given the map shown and several clues.



**Part A** The first clue states the following.

Skyline Trail forms a transversal with Hood Path and Mission Path. Go to the corners that form same side exterior angles north of Skyline Trail.

Which two corners does the clue mean? Use intersections and directions to explain.

**Part B** If the second clue states the following, what trail marker should they go to?

Hood and Mission Paths are parallel, and the northeast corner of Hood Path and Skyline Trail forms a  $131^\circ$  angle. The angle measure formed by the southwest corner of Skyline Trail and Mission Path is equal to the trail marker number on River Trail you must go to.