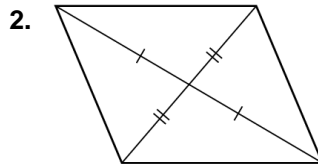
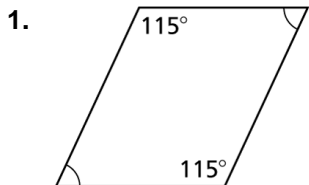


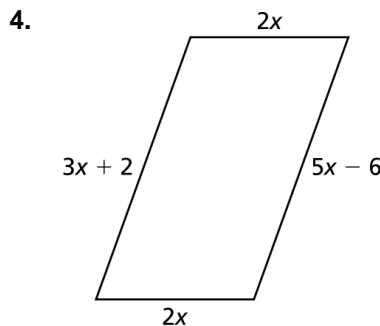
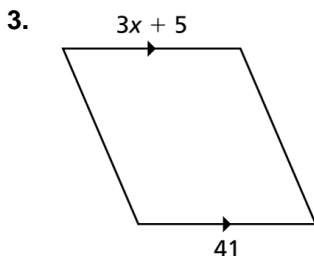
# 7.3

## Practice A

In Exercises 1 and 2, state which theorem you can use to show that the quadrilateral is a parallelogram.



In Exercises 3 and 4, find the value of  $x$  that makes the quadrilateral a parallelogram.

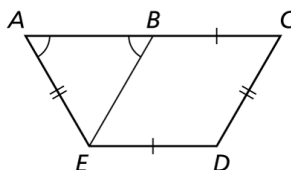


In Exercises 5 and 6, graph the quadrilateral with the given vertices in a coordinate plane. Then show that the quadrilateral is a parallelogram.

5.  $A(-4, -2), B(-2, 1), C(4, 1), D(2, -2)$       6.  $E(-4, 1), F(-1, 5), G(11, 0), H(8, -4)$

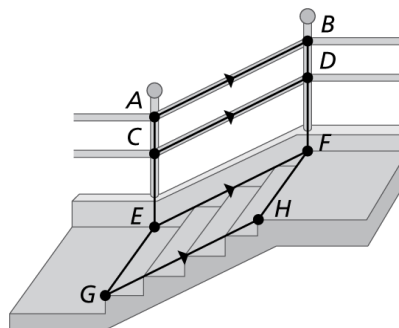
7. Use the diagram to write a two-column proof.

**Given:**  $\angle A \cong \angle ABE$   
 $\overline{AE} \cong \overline{CD}, \overline{BC} \cong \overline{DE}$



**Prove:**  $BCDE$  is a parallelogram.

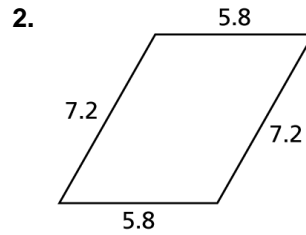
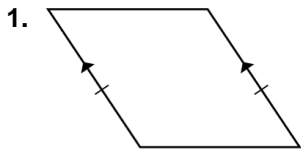
8. In the diagram of the handrail for a staircase shown,  $m\angle A = 145^\circ$  and  $\overline{AB} \cong \overline{CD}$ .
- Explain how to show that  $ABDC$  is a parallelogram.
  - Describe how to prove that  $CDFE$  is a parallelogram.
  - Can you prove that  $EFHG$  is a parallelogram? Explain.
  - Find  $m\angle ACD, m\angle DCE, m\angle CEF,$  and  $m\angle EFD$ .



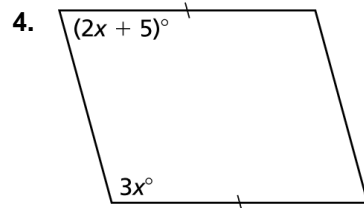
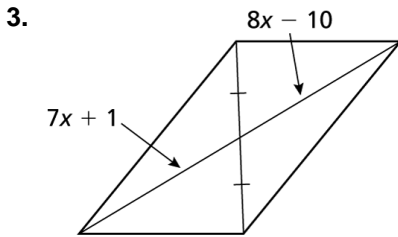
# 7.3

## Practice B

In Exercises 1 and 2, state which theorem you can use to show that the quadrilateral is a parallelogram.



In Exercises 3 and 4, find the value of  $x$  that makes the quadrilateral a parallelogram.

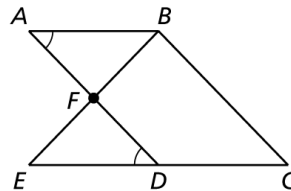


In Exercises 5 and 6, graph the quadrilateral with the given vertices in a coordinate plane. Then show that the quadrilateral is a parallelogram.

5.  $W(-3, -1), X(-3, 4), Y(3, 2), Z(3, -3)$       6.  $A(-4, 0), B(2, 2), C(5, -1), D(-1, -3)$

7. Use the diagram to write a two-column proof.

- Given:**  $\angle A \cong \angle FDE$   
 $F$  is the midpoint of  $\overline{AD}$ .  
 $D$  is the midpoint of  $\overline{CE}$ .



**Prove:**  $ABCD$  is a parallelogram.

8. A quadrilateral has two pairs of congruent angles. Can you determine whether the quadrilateral is a parallelogram? Explain your reasoning.

9. An octagon star is shown in the figure on the right.

- Find  $m\angle FCG$ ,  $m\angle BCF$ , and  $m\angle D$ .
- State which theorem you can use to show that the quadrilateral is a parallelogram.
- The length of  $\overline{AB}$  is three times the length of  $\overline{AD}$ . Write an expression for the perimeter of parallelogram  $ABCD$  in terms of the variable  $x$ .

