

**Warm Up 61**

1. rhombus, square
2. true
3. C

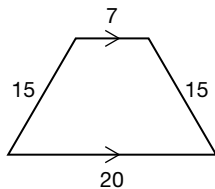
**Lesson Practice 61**

- a. Since the opposite sides of  $ABCD$  are congruent,  $ABCD$  is a parallelogram. From the properties of parallelograms, the diagonals of a parallelogram must bisect each other.
- b. Since the opposite angles of  $EFGH$  are congruent,  $EFGH$  is a parallelogram. A property of parallelograms is that opposite sides are congruent.
- c. By CPCTC,  $\overline{WX} \cong \overline{ZY}$ . Also by CPCTC,  $\angle WYZ \cong \angle YWX$ . Since the alternate interior angles are congruent,  $\overline{WX} \parallel \overline{ZY}$  by the Converse of the Alternate Interior Angles Theorem. Since  $\overline{WX} \parallel \overline{ZY}$  and  $\overline{WX} \cong \overline{ZY}$ ,  $WXYZ$  is a parallelogram.
- d. By CPCTC, the corresponding sides  $\overline{AE}$  and  $\overline{EC}$  are congruent. Corresponding sides  $\overline{DE}$  and  $\overline{EB}$  are also congruent, so the diagonals of  $ABCD$  bisect each other, which proves that  $ABCD$  is a parallelogram.
- e. Since  $\angle 1 \cong \angle 2$  and  $\angle 3 \cong \angle 4$ , the staircase railing is a parallelogram. So, the top and bottom railings are parallel.

## Practice 61

- $x = 1.1, y = 9.1$
- about 41 cm more
- $17\sqrt{3}$  and 34
- $x = 4\sqrt{3}$  and  $y = 8$
- See student work; divide circle in half, then divide one half into thirds
- No, they are not parallel.
- 156 m
- proportional
- $Q(-0.5, 4.5); R(2, 2.5)$
- No, because the paths taken by Smith and Claude will form a  $45^\circ-45^\circ-90^\circ$  right triangle, the hypotenuse of which will be  $\sqrt{2}$  miles or about 1.41 miles long.
- approximately 34
- A
- $346 \text{ ft}^2$
- $608 \text{ ft}^2$
- $(10 + 10\sqrt{3}) \text{ cm}$
- 24 inches
- $x > 5.4; 0 < x < 5.4$
- about  $45^\circ$
- A:  $\frac{1}{4}$ ; B:  $\frac{1}{4}$ ; C:  $\frac{1}{8}$ ; D:  $\frac{1}{8}$ ;  
E:  $\frac{1}{16}$ ; F:  $\frac{1}{8}$ ; G:  $\frac{1}{16}$
- D
- 7.2
- a. right triangle  
b.  $37^\circ$
- By the Linear Pair Theorem,  $\angle 1$  and  $\angle 4$  are supplementary, as are  $\angle 2$  and  $\angle 3$ . It is given that  $\angle 4 \cong \angle 3$ , so by the Congruent Supplements Theorem,  $\angle 1 \cong \angle 2$ . By the definition of congruent angles,  $m\angle 1 = m\angle 2$ .
- sometimes

25. No, the side on the bottom could either make it a parallelogram or it could be longer and make the shape a trapezoid.



26. Yes, the line will always be parallel to the third side. A midpoint, by definition, cuts each side into congruent segments. If a line cuts congruent segments on two sides of a triangle, then it is parallel to the third side. This is a specific case of the Converse of the Triangle Proportionality Theorem.
27.  $(0, w)$
28.  $\overline{JH}$
29. yes; a rhombus
30. a point or a circle