Name ______________________________ Date ______________

LESSON 4.8

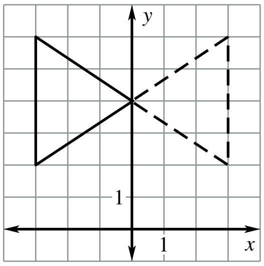
Practice B

For use with pages 283–291

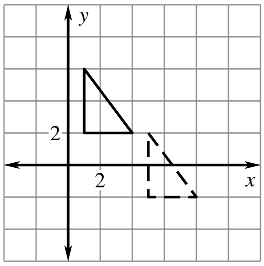
LESSON 4.8

Name the type of transformation shown.

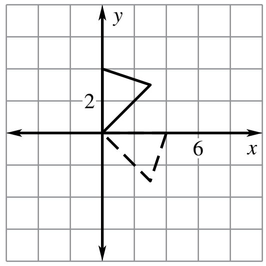
1.



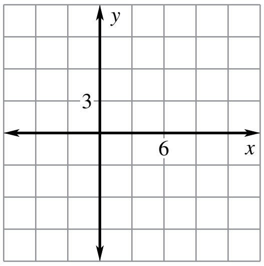
2.



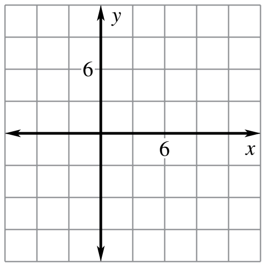
3.



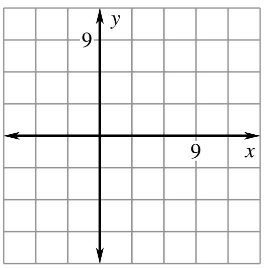
4. Figure *ABCD* has vertices $A(1, 2)$, $B(4, -3)$, $C(5, 5)$, and $D(4, 7)$. Sketch *ABCD* and draw its image after the translation $(x, y) \rightarrow (x + 5, y + 3)$.



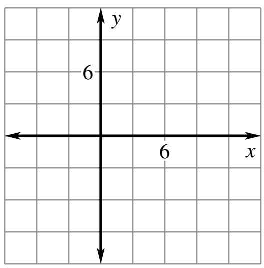
5. Figure *ABCD* has vertices $A(-2, 3)$, $B(1, 7)$, $C(6, 2)$, and $D(-1, -2)$. Sketch *ABCD* and draw its image after the translation $(x, y) \rightarrow (x - 2, y - 4)$.



6. Figure *ABCD* has vertices $A(3, -1)$, $B(6, -2)$, $C(5, 3)$, and $D(0, 4)$. Sketch *ABCD* and draw its image after the translation $(x, y) \rightarrow (x - 3, y + 2)$.



7. Figure *ABCD* has vertices $A(-1, 3)$, $B(4, -1)$, $C(6, 4)$, and $D(1, 5)$. Sketch *ABCD* and draw its image after the translation $(x, y) \rightarrow (x + 4, y - 5)$.



Use coordinate notation to describe the translation.

8. 3 units to the right, 5 units down

9. 7 units to the left, 2 units down

10. 4 units to the left, 6 units up

11. 1 unit to the right, 8 units up

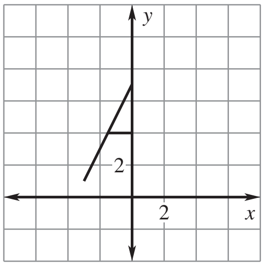
Name ____________________ Date __________

LESSON **4.8** **Practice B** *continued*

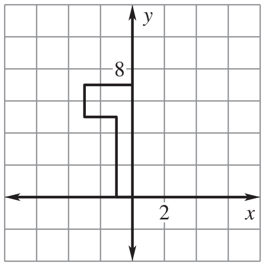
For use with pages 283–291

Use a reflection in the *y*-axis to draw the other half of the figure.

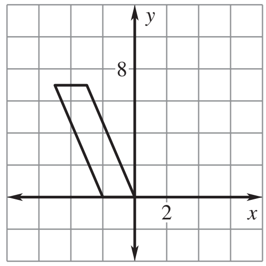
12.



13.

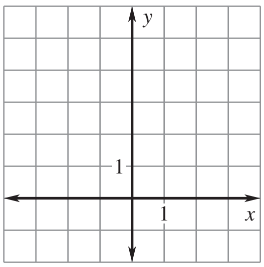


14.

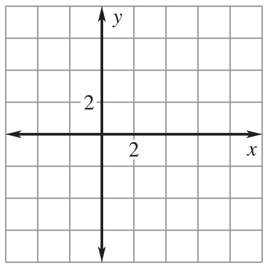


Use the coordinates to graph $\overline{AB}$ and $\overline{CD}$. Tell whether $\overline{CD}$ is a rotation of $\overline{AB}$ about the origin. If so, give the angle and direction of rotation.

15. $A(-2, 5), B(-2, 0), C(0, 1), D(3, 1)$



16. $A(1, 4), B(4, 1), C(1, -4), D(4, -1)$



Complete the statement using the description of the translation. In the description, points (2, 0) and (3, 4) are two vertices of a triangle.

17. If (2, 0) translates to (4, 1), then (3, 4) translates to __?__.

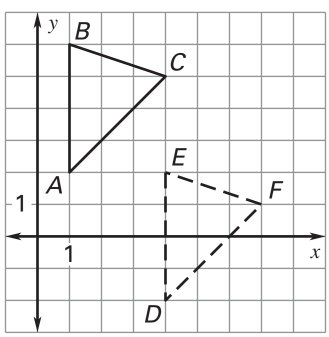
18. If (2, 0) translates to $(-2, -1)$, then (3, 4) translates to __?__.

A point on an image and the transformation are given. Find the corresponding point on the original figure.

19. Point on image: $(2, -4)$; transformation: $(x, y) \rightarrow (x - 4, y + 3)$

20. Point on image: $(-5, -7)$; transformation: $(x, y) \rightarrow (x, -y)$

21. **Verifying Congruence** Verify that $\triangle DEF$ is a congruence transformation of $\triangle ABC$. *Explain* your reasoning.



ANSWERS

Statements	Reasons
14. $m\angle ABH = 90°$, $m\angle GHE = 90°$, $m\angle DEA = 90°$	**14.** Definition of right angles
15. $m\angle ABE = m\angle ABH + m\angle HBE$, $m\angle GHB = m\angle GHE + m\angle EHB$, $m\angle DEH = m\angle DEA + m\angle AEH$	**15.** Angle Addition Postulate
16. $m\angle ABE = 60° + 90°$, $m\angle GHB = 60° + 90°$, $m\angle DEH = 60° + 90°$	**16.** Substitution property of equality
17. $m\angle ABE = 150°$, $m\angle GHB = 150°$, $m\angle DEH = 150°$	**17.** Simplify.
18. $\angle ABE \cong \angle GHB \cong \angle DEH$	**18.** Definition of congruent angles
19. $\triangle AEB \cong \triangle GBH \cong \triangle DHE$	**19.** SAS Congruence Postulate
20. $\overline{AE} \cong \overline{DH} \cong \overline{GB}$	**20.** Corresp. parts of $\cong \triangle$ are $\cong$.

4. a.

Stage	1	2	3	4	5
Triangles	3	9	27	81	243
Side length	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{32}$
Area	$\frac{3\sqrt{3}}{16}$	$\frac{9\sqrt{3}}{64}$	$\frac{27\sqrt{3}}{256}$	$\frac{81\sqrt{3}}{1024}$	$\frac{243\sqrt{3}}{4096}$

b. $T = 3^n, L = \left(\frac{1}{2}\right)^n, A = \left(\frac{\sqrt{3}}{4}\right)\left(\frac{3}{4}\right)^n$;

When $n = 12$: $T = 531{,}441$, $L = \frac{1}{4096}$,

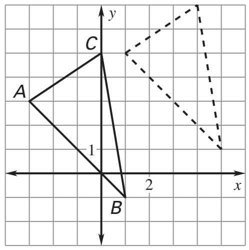
$A = \frac{531{,}441\sqrt{3}}{67{,}108{,}864}$

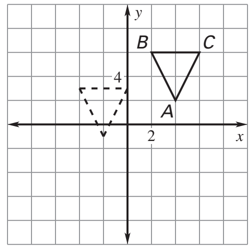
Lesson 4.8

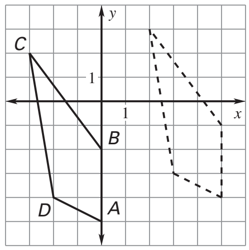
Practice Level A

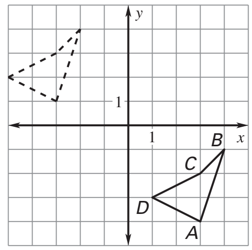
1. translation **2.** rotation **3.** reflection or rotation

4. reflection

5.


6.


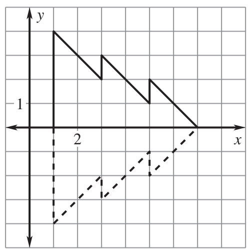
7.


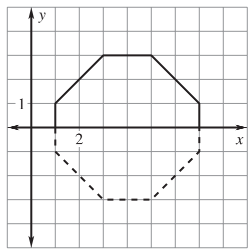
8.


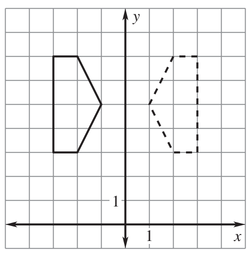
9. $(x, y) \to (x + 5, y - 3)$

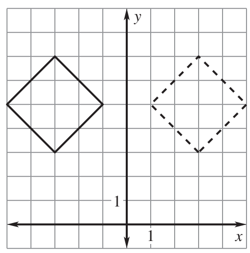
10. $(x, y) \to (x - 9, y + 7)$ **11.** $(12, -5)$

12. $(1, 7)$

13.


14.


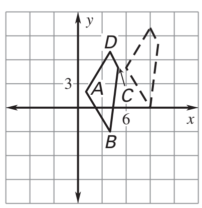
15.


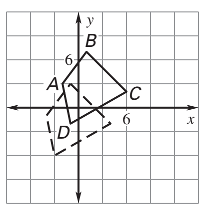
16.


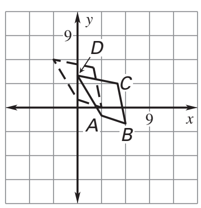
17. rotation; 90° clockwise **18.** not a rotation

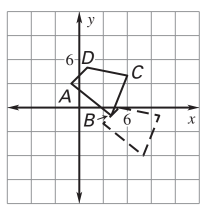
Practice Level B

1. reflection **2.** translation **3.** rotation

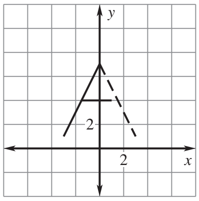
4.


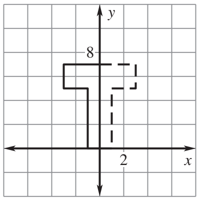
5.


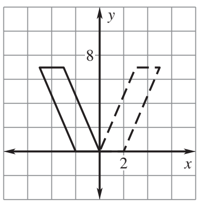
6.


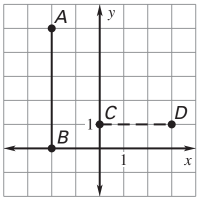
7.


8. $(x, y) \rightarrow (x + 3, y - 5)$
9. $(x, y) \rightarrow (x - 7, y - 2)$
10. $(x, y) \rightarrow (x - 4, y + 6)$
11. $(x, y) \rightarrow (x + 1, y + 8)$

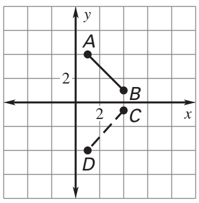
12.


13.


14.


15.


not a rotation

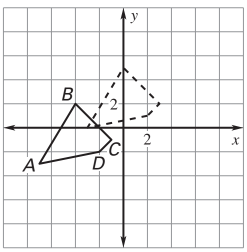
16.


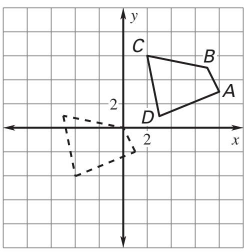
rotation; 90° clockwise

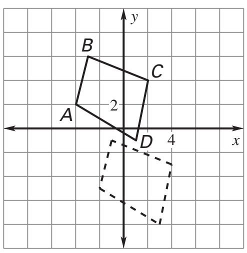
17. (5, 5) **18.** (−1, 3) **19.** (6, −7) **20.** (−5, 7)
21. Use the Distance Formula to show that corresponding sides are congruent. $\triangle ABC \cong \triangle DEF$ by SSS Congruence Postulate.

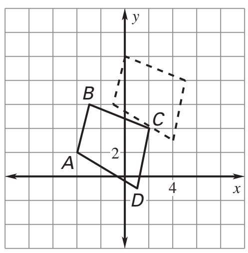
Practice Level C

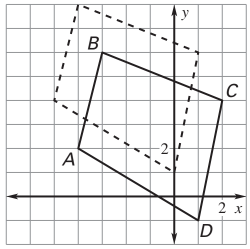
1. transformation **2.** rotation **3.** reflection

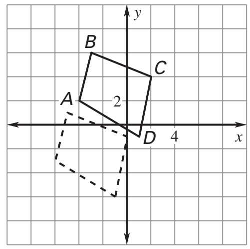
4.


5.


6.


7.


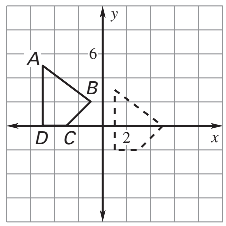
8.


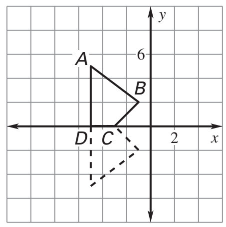
9.


10. (4, 7) **11.** (−6, −2) **12.** (11, 8)
13. The rotation segment should connect corresponding angles of the triangles. $\triangle DEF$ is a 90° clockwise rotation of $\triangle ABC$.
14. $\overline{KD}$ **15.** $\triangle BHA$ **16.** $\overline{DK}$ **17.** $\triangle GCM$
18. $\overline{JK} \cong \overline{MN}$, $\overline{KL} \cong \overline{NL}$, and $\angle K \cong \angle N$. By SAS, $\triangle MNL \cong \triangle JKL$ so it is a congruence transformation. **19.** (2, −3), (5, −6), (3, −9)

Review for Mastery

1. Reflection in a horizontal line

2.


3.


4. Yes; 90° counterclockwise rotation
5. not a rotation

Problem Solving Workshop: Mixed Problem Solving

1. a. $D(-4, -7)$, $E(-7, -2)$, $F(-3, -5)$ **b.** $G(2, 11)$, $H(-1, 6)$, $J(3, 9)$ **c.** $M(4, -7)$, $N(7, -2)$, $O(3, -5)$ **2. a.** $\triangle ABD$ and $\triangle CBD$ are congruent equilateral triangles so $\overline{AB} \cong \overline{CB}$ and therefore $\triangle ABC$ is isosceles by definition. **b.** Base Angles Theorem **c.** Since $\triangle ABD$ and $\triangle CBD$ are congruent equilateral triangles, $\overline{AB} \cong \overline{CB}$ and $\angle ABD \cong \angle CBD$. By the Base Angles Theorem, $\angle BAE \cong \angle BCE$. Then $\triangle ABE \cong \triangle CBE$ by the AAS Congruence Theorem. By the Linear Pair Postulate, $m\angle AEB + m\angle CEB = 180°$. But $\angle AEB$ and $\angle CEB$ are corresponding parts of congruent

ANSWERS