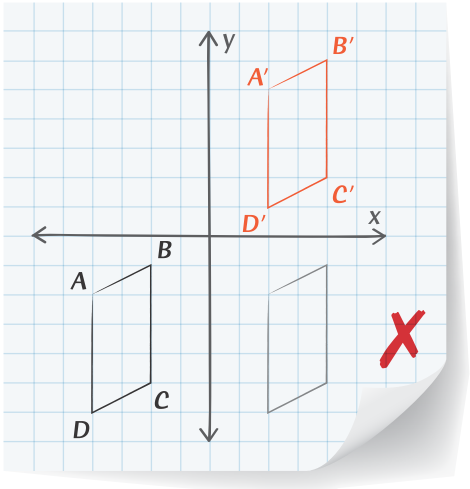
PRACTICE & PROBLEM SOLVING

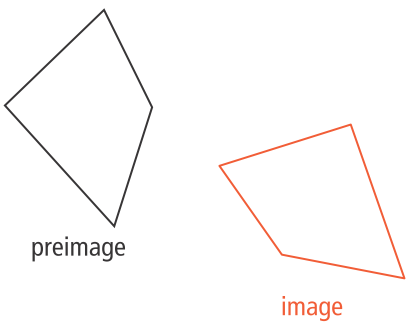
UNDERSTAND

8. Construct Arguments Write a paragraph proof of the Corollary to Theorem 3-4.

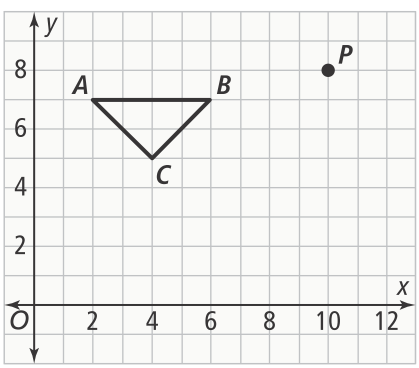
9. Error Analysis Damian draws the diagram for the glide reflection $(T_{\langle 0,\, 7\rangle} \circ R_{y\text{-axis}})(ABCD)$. What error did he make?



10. Higher Order Thinking What are the reflection and translation for the glide reflection shown? Sketch the intermediate image.

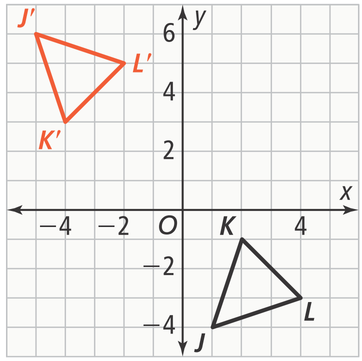


11. Mathematical Connections What are the coordinates of the vertices of $\triangle A'B'C'$ after a reflection across a line through point P with a y-intercept at $y = -2$, followed by translation $T_{\langle 3,\, 3\rangle}$?



PRACTICE

12. What are two rigid motions with a composition that maps $\triangle JKL$ to $\triangle J'K'L'$? SEE EXAMPLES 1 AND 2



For Exercises 13–17, given $A(6, -4)$, $B(3, 8)$, and $C(-7, 9)$, determine the coordinates of the vertices of $\triangle A'B'C'$ for each glide reflection. Suppose p is the line with equation $x = -3$, q is the line with equation $y = 9$, and r is the line with equation $y = -2$. SEE EXAMPLE 3

13. $(T_{\langle 0,\, -2\rangle} \circ R_{y\text{-axis}})(\triangle ABC) = \triangle A'B'C'$

14. $(T_{\langle 4,\, 0\rangle} \circ R_{x\text{-axis}})(\triangle ABC) = \triangle A'B'C'$

15. $(T_{\langle 0,\, 8\rangle} \circ R_p)(\triangle ABC) = \triangle A'B'C'$

16. $(T_{\langle -5,\, 0\rangle} \circ R_q)(\triangle ABC) = \triangle A'B'C'$

17. $(T_{\langle 7,\, 0\rangle} \circ R_r)(\triangle ABC) = \triangle A'B'C'$

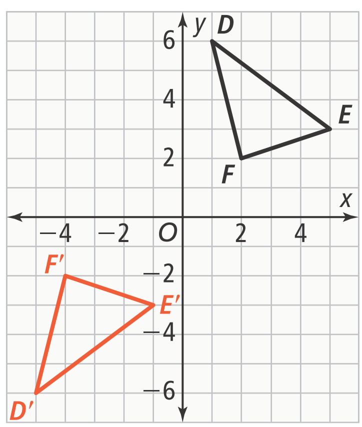
For Exercises 18–21, write a rule for each glide reflection that maps $\triangle DEF$ to $\triangle D'E'F'$. SEE EXAMPLE 4

18. $D(7, -2)$, $E(3, 9)$, $F(8, 6)$;
$D'(-5, 1)$, $E'(-1, 12)$, $F'(-6, 9)$

19. $D(-5, 8)$, $E(1, 4)$, $F(6, 3)$;
$D'(-3, 8)$, $E'(3, 12)$, $F'(8, 13)$

20. $D(0, 4)$, $E(6, 3)$, $F(9, 8)$;
$D'(-6, -8)$, $E'(0, -7)$, $F'(3, -12)$

21.



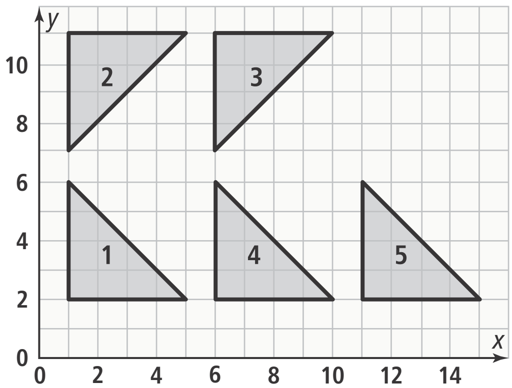
PRACTICE & PROBLEM SOLVING

Practice Tutorial

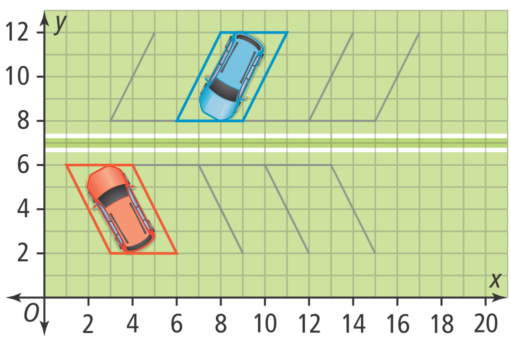
Mixed Review Available Online

APPLY

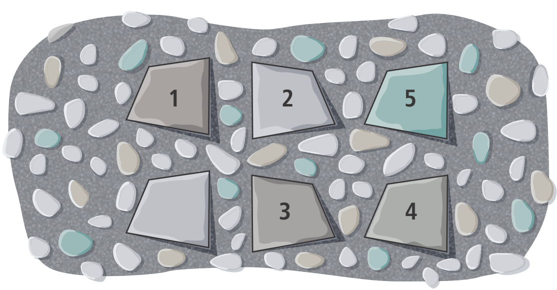
22. **Look for Relationships** The diagram shows one section of concrete being stamped with a pattern. The design can be described by two glide reflections from triangle 1 to triangle 5. Write the rules for each glide reflection.



23. **Model With Mathematics** Each parking space in the figure can be the image of another parking space as a glide reflection. What is the rule that maps the parking space where the red car is parked to the parking space where the blue car is parked?

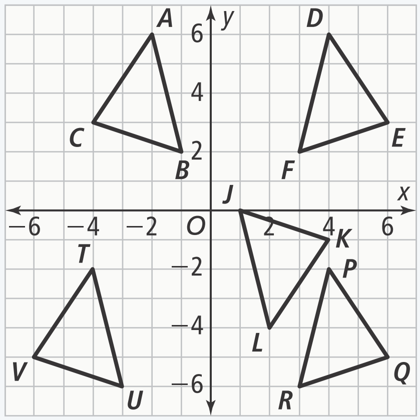


24. **Look for Relationships** Starting from tile 1, quadrilateral tiles are embedded into a wall following a pattern of glide reflections. If the pattern continues, what are the shapes and locations of the next two tiles the builder will place in the wall? Explain.



ASSESSMENT PRACTICE

25. Match each rigid motion with its image.



I. $r_{(180°,\ (0,\ 1))}(\triangle ABC)$

II. $(T_{\langle 0,\ 8\rangle} \circ R_{y\text{-axis}})(\triangle TUV)$

III. $(T_{\langle 2,\ 0\rangle} \circ R_{y\text{-axis}})(\triangle DFE)$

IV. $R_{y\text{-axis}}(\triangle TUV)$

A. $\triangle ABC$

B. $\triangle DFE$

C. $\triangle LJK$

D. $\triangle PRQ$

26. **SAT/ACT** Suppose m is the line with equation $y = 3$. Given $A(7, 1)$, $B(2, 9)$, and $C(3, -5)$, what are the coordinates of the vertices of $\triangle A'B'C'$ for $\left(T_{\langle -4,\ 0\rangle} \circ R_m\right)(\triangle ABC) = \triangle A'B'C'$?

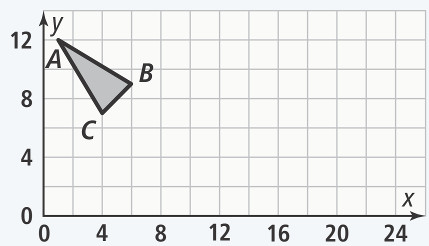
Ⓐ $A'(11, 4)$, $B'(6, 12)$, $C'(7, -2)$

Ⓑ $A'(11, 5)$, $B'(-6, -3)$, $C'(7, 11)$

Ⓒ $A'(3, 4)$, $B'(-2, 12)$, $C'(-1, -2)$

Ⓓ $A'(3, 5)$, $B'(-2, -3)$, $C'(-1, 11)$

27. **Performance Task** Glide reflections are used to print a design across a length of wrapping paper.



Part A Copy the diagram and draw image $\triangle A'B'C' = \left(T_{\langle 0,\ -2\rangle} \circ R_{\ell}\right)(\triangle ABC)$, where ℓ is the line with equation $x = 5$.

Part B Translate $\triangle ABC$ 7 units to the right to print $\triangle DEF$ and 14 units to right to print $\triangle GHJ$. What glide reflections of $\triangle DEF$ and $\triangle GHJ$ result in the same arrangement of figures as in Part A? Draw these images to create the wrapping paper pattern.