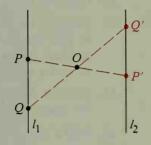
For each transformation given in Exercises 5-10:

- a. Plot the three points A(0, 4), B(4, 6), and C(2, 0) and their images A', B', and C' under the transformation.
- b. State whether the transformation appears to be an isometry.
- c. Find the preimage of (12, 6).
- 5. $T:(x, y) \to (x + 4, y 2)$
- 6. $S:(x, y) \rightarrow (2x + 4, 2y 2)$

7. $D:(x, y) \to (3x, 3y)$

8. $H:(x, y) \to (-x, -y)$

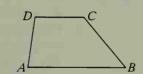
- 9. $M:(x, y) \to (12 x, y)$
- 10. $G:(x, y) \to (-\frac{1}{2}x, -\frac{1}{2}y)$
- 11. O is a point equidistant from parallel lines l_1 and l_2 . A mapping M maps each point P of l_1 to the point P' where \overrightarrow{PO} intersects l_2 .
 - **a.** Is the mapping a one-to-one mapping of l_1 onto l_2 ?
 - b. Does this mapping preserve or distort distance?
 - c. If l_1 and l_2 were not parallel, would the mapping preserve distance? Illustrate your answer with a sketch.



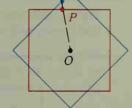
12. $\triangle XYZ$ is isosceles with $\overline{XY} \cong \overline{XZ}$. Describe a way of mapping each point of \overline{XY} to a point of \overline{XZ} so that the mapping is an isometry.



B 13. \overrightarrow{ABCD} is a trapezoid. Describe a way of mapping each point of \overrightarrow{DC} to a point of \overrightarrow{AB} so that the mapping is one-to-one. Is your mapping an isometry?



- 14. The red and blue squares are congruent and have the same center O. A mapping maps each point P of the red square to the point P' where \overrightarrow{OP} intersects the blue square.
 - a. Is this mapping one-to-one?
 - **b.** Copy the diagram and locate a point X that is its own image.
 - c. Locate two points R and S on the red square and their images R' and S' on the blue square that have the property that $RS \neq R'S'$.



- d. Does this mapping preserve distance?
- **e.** Describe a mapping from the red square onto the blue square that *does* preserve distance.
- 15. The transformation $T:(x, y) \to (x + y, y)$ preserves areas of figures even though it does not preserve distances. Illustrate this by drawing a square with vertices A(2, 3), B(4, 3), C(4, 5), and D(2, 5) and its image A'B'C'D'. Find the area and perimeter of each figure.