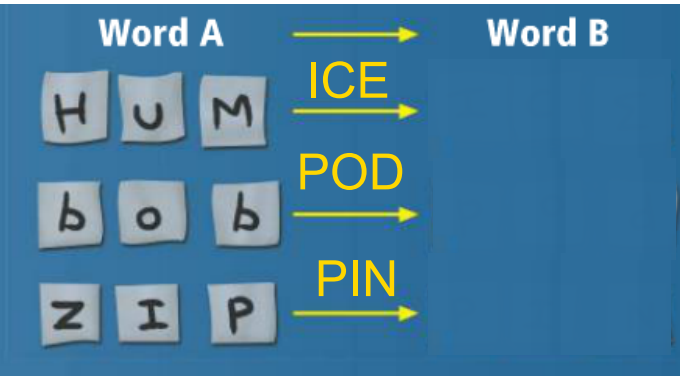
Geometry

Chapter 9

Section 9-1

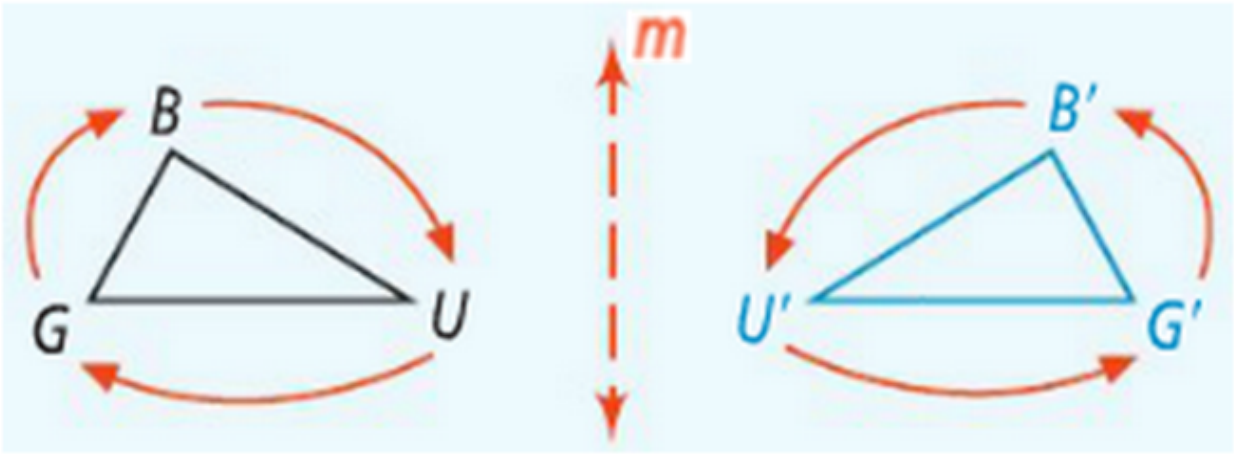
Suppose you write the letters shown on squares of tracing paper so their shapes are visible from both sides. For each pair of words, how can you move the squares of paper to change Word A into Word B? Note: No square should remain in its original position.



Concepts

- Transformation - a change in position, shape or size of a geometric figure
- Preimage - the given figure, before the transformation
- Image - the result of the transformation, the "after"
- Rigid motion - type of transformation that preserves angle measures and distance

Prime notation



$\Delta BUG \Rightarrow \Delta B'U'G'$

preimage image

In the diagram, $EFGH \rightarrow E'F'G'H'$.

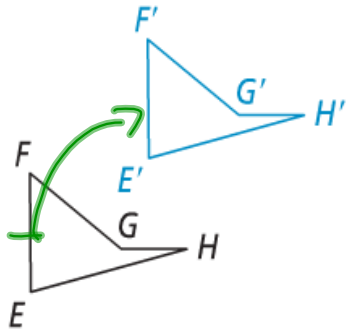
A What are the images of $\angle F$ and $\angle H$?

$\angle F'$, $\angle H'$

B What are the pairs of corresponding sides?

$\overline{EF}$ and $\overline{E'F'}$ $\overline{FG}$ and $\overline{F'G'}$

$\overline{EH}$ and $\overline{E'H'}$ $\overline{GH}$ and $\overline{G'H'}$

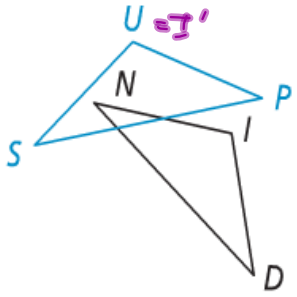


$EFGH \rightarrow E'F'G'H'$

In the diagram, $\triangle NID \rightarrow \triangle SUP$.

a. What are the images of $\angle I$ and point D?

b. What are the pairs of corresponding sides?



a) $\angle U$, Point P

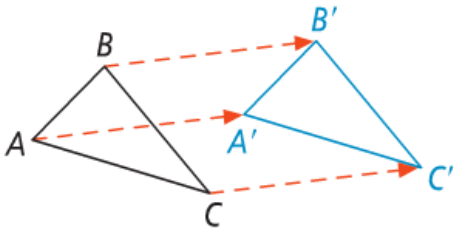
b) $\overline{NI} \rightarrow \overline{SU}$

$\overline{ND} \rightarrow \overline{SP}$

$\overline{ID} \rightarrow \overline{UP}$

A **translation** is a transformation that maps all points of a figure the same distance in the same direction.

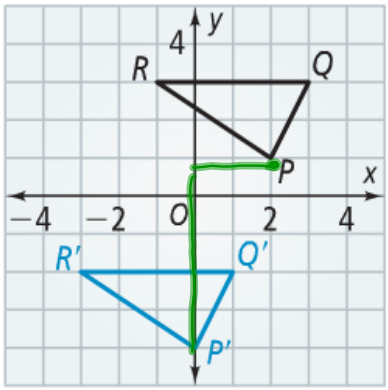
You write the translation that maps $\triangle ABC$ onto $\triangle A'B'C'$ as $T(\triangle ABC) = \triangle A'B'C'$. A translation is a rigid motion with the following properties.



If $T(\triangle ABC) = \triangle A'B'C'$, then

- $AA' = BB' = CC'$
- $AB = A'B', BC = B'C', AC = A'C'$
- $m\angle A = m\angle A', m\angle B = m\angle B', m\angle C = m\angle C'$

Describe how ΔPQR is translated.



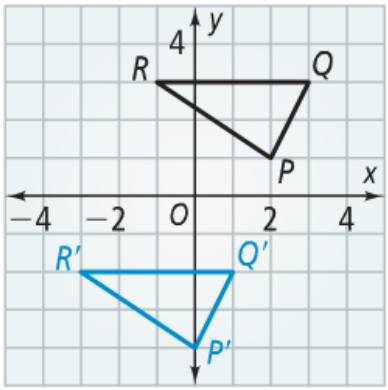
Translated △PQR
left 2 & down 5

A translation "slides" an object. That slide has two components: a vertical shift and a horizontal shift. Those can be identified by a translation rule:

$$T_{<x,y>}(shape)$$

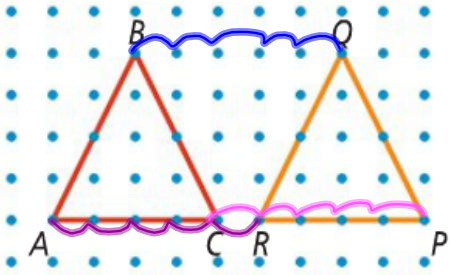
T - translation, x - horizontal shift, y - vertical shift, *shape* - shape being moved

Write a translation rule for ΔPQR.



$T_{\langle -2,-5\rangle}(\triangle PQR) = \triangle P'Q'R'$

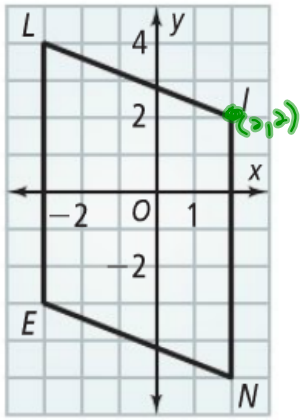
Write a translation rule.



$T_{\langle 5,0\rangle}(\triangle ABC) = \triangle RQP$

$T_{\langle -5,0\rangle}(\triangle RQP) = \triangle ABC$

A particle starts at point L and moves around the shape in order from L to I to N to E. Describe the particle's movement using translation rules and coordinates.

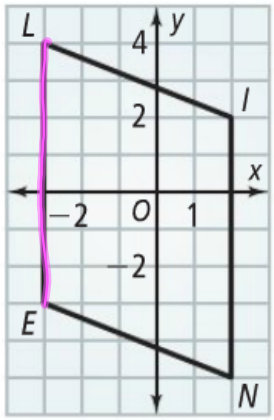


$T_{\langle 5,-2\rangle}(-3,4) = (2,2)$

$T_{\langle 0,-7\rangle}(2,2) = (2,-5)$

$T_{\langle -5,2\rangle}(2,-5) = (-3,-3)$

A particle starts at point L and moves around the shape in order from L to I to N to E. Describe the particle's movement using one translation rule and coordinates.



$T_{\langle 0,-7\rangle}(-3,4)$

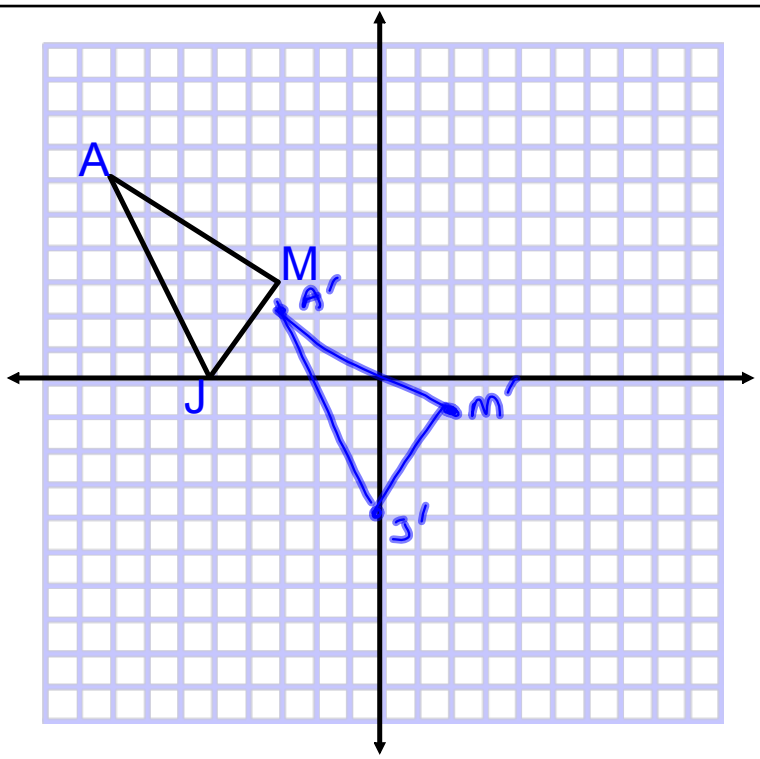
Draw the image of the following translation. Then give the coordinates for J', A', and M'.

$T_{<5,-4>}(\Delta JAM)$

J'(0, -4)

A'(-3, 2)

M'(2, -1)



Homework

Pages 550 - 552

12 - 18 all, 21 - 26 all, 28, 30 - 33, all