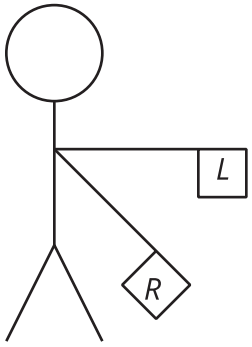
Incorporating Rotations

Let's draw some transformations.

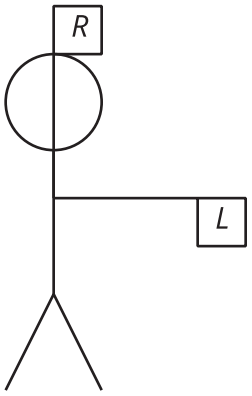
13.1 Left to Right

Flag semaphore is a way to use flags to signal messages. The diagrams show how to signal the letters Z and J in the semaphore alphabet. For each, precisely describe a rotation that would take the left-hand flag (L) to the right-hand flag (R).

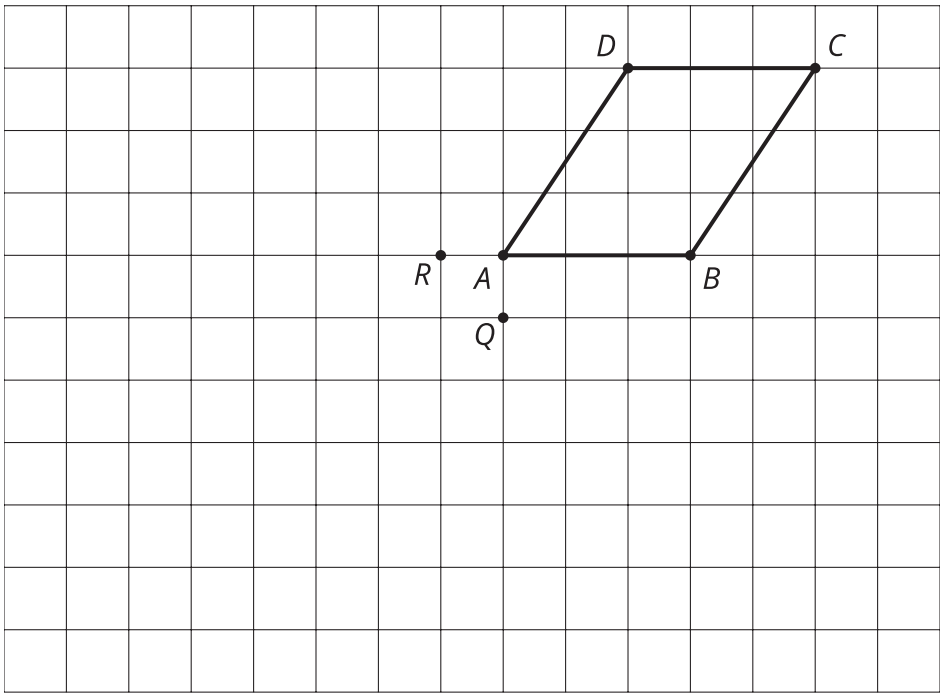
Z



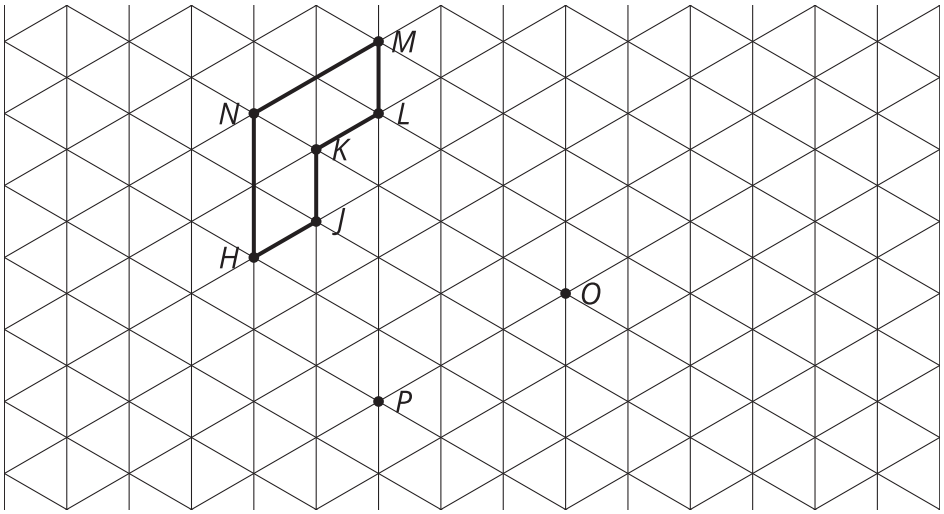
J



13.2 Turning on a Grid



1. Rotate $ABCD$ 90 degrees clockwise around Q.
2. Rotate $ABCD$ 180 degrees around R.
3. Rotate $HJKLMN$ 120 degrees clockwise around O.
4. Rotate $HJKLMN$ 60 degrees counterclockwise around P.

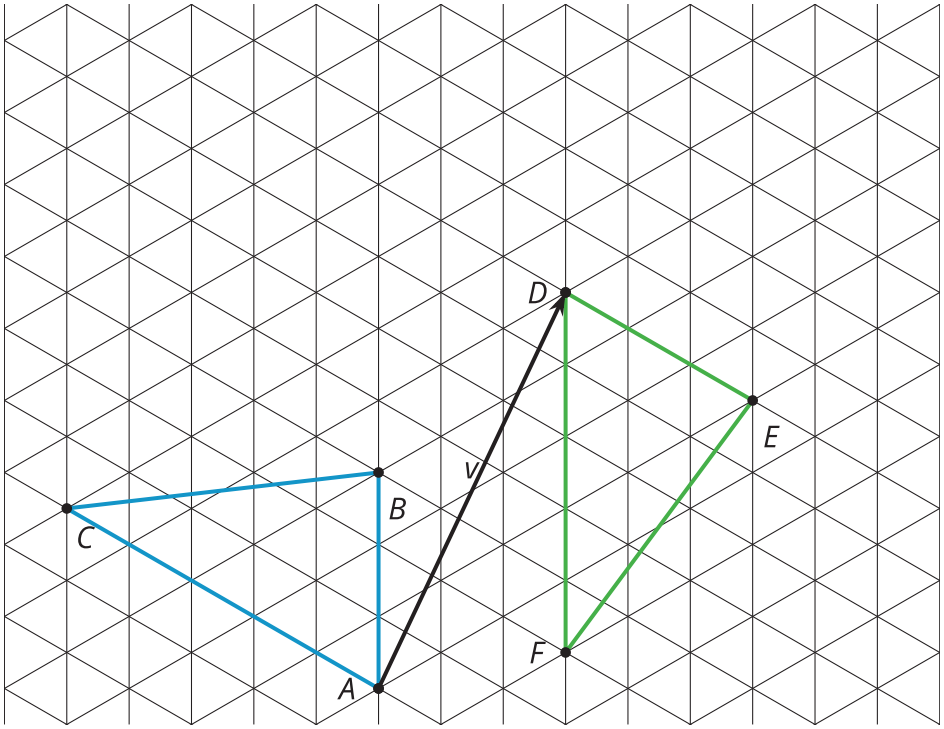


13.3 Translate, Rotate, Reflect

Mai suspects triangle ABC is congruent to triangle DEF. She thinks these steps will work to show that there is a rigid transformation from ABC to DEF.

- Translate by directed line segment v.
- Rotate the image ____ degrees clockwise around point D.
- Reflect that image over line DE.

Draw each image, and determine the angle of rotation needed for these steps to take ABC to DEF.



Are you ready for more?

Mai's first 2 steps could be combined into a single rotation.

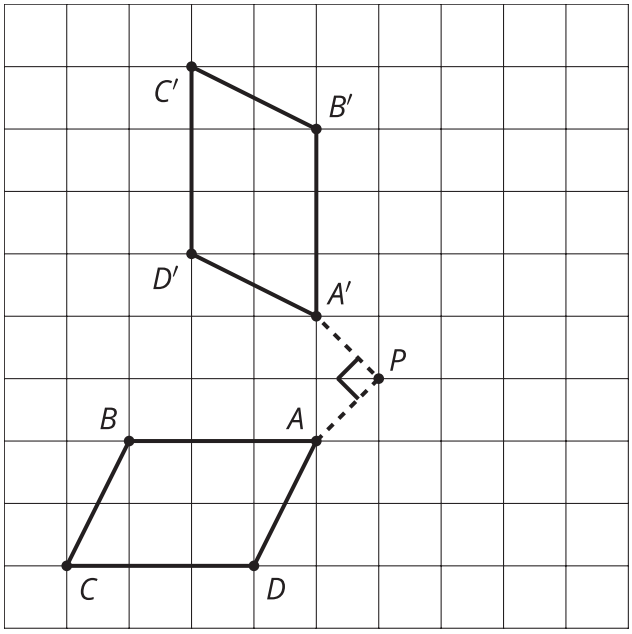
1. Find the center and angle of this rotation.

2. Describe a general procedure for finding a center of rotation.

Lesson 13 Summary

The three rigid motions are reflect, translate, and rotate. Each of these rigid motions can be applied to any figure to create an image that is congruent. To do a rotation, we need to know three things: the center, the direction, and the angle.

Rotate $ABCD$ 90 degrees clockwise around point P.



Rotate EFG 120 degrees counterclockwise around point C.

