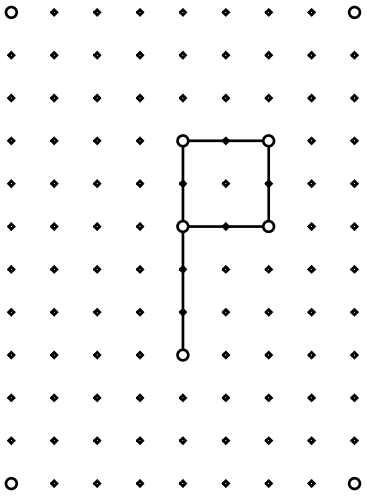
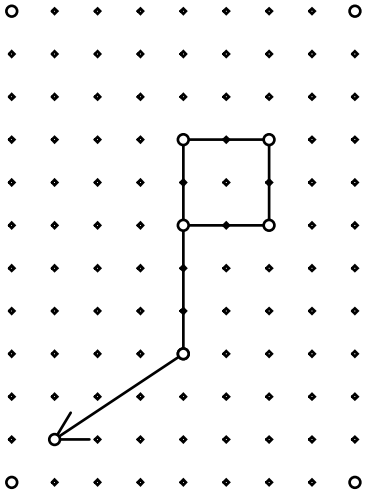
Transformations:

Translations are described with vectors. A vector is either an ordered pair of numbers to tell you how far over and how far up to shift, or it is an arrow (or vector) drawn to show the same thing.

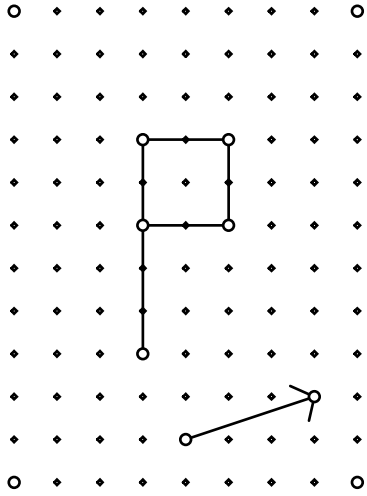
1. Shift the flag by (-2,3)



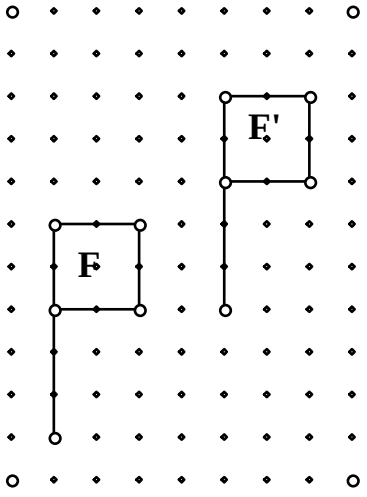
2. Shift the flag to the position shown by the arrow:



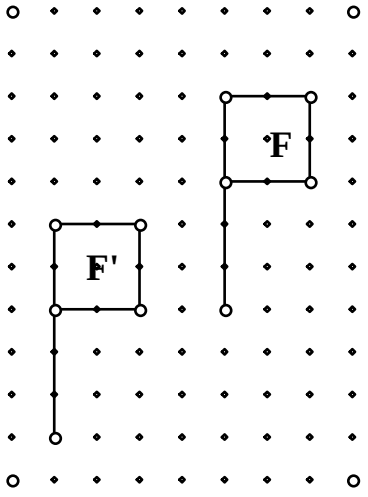
3. Shift the flag to the position shown by the vector:



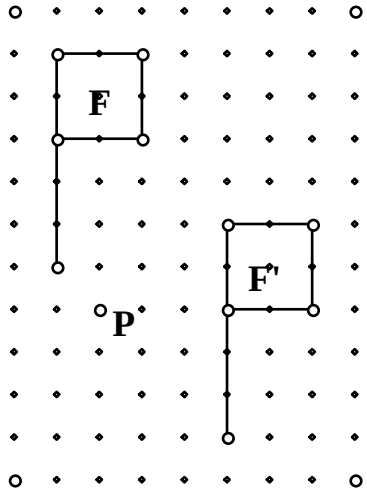
4. Draw a vector, and tell coordinates to describe the shift below:



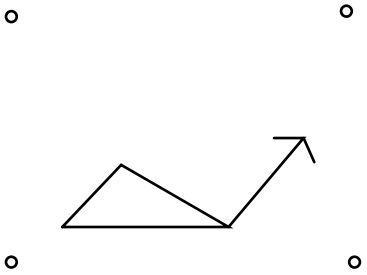
5. Draw a vector, and tell coordinates to describe the shift below:



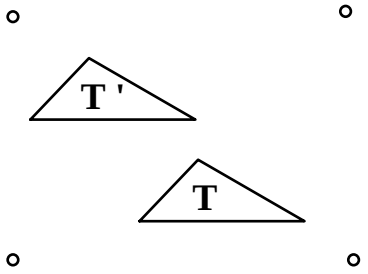
6. Draw a vector starting at the point P to describe the shift below



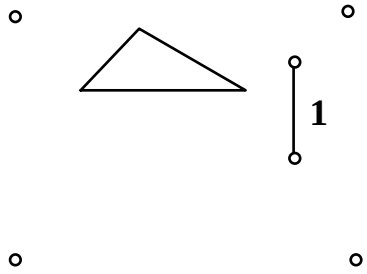
7. Draw the triangle after shifting by the vector shown:



8. Draw a vector that shows the shift shown

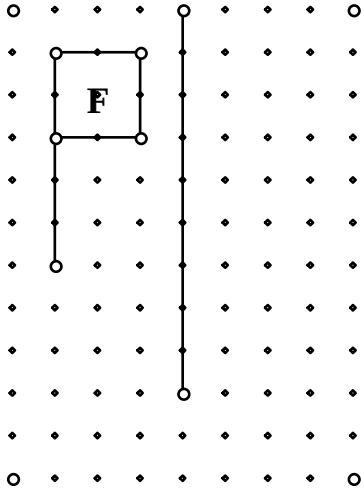


9. Draw the triangle shifted down 1 unit

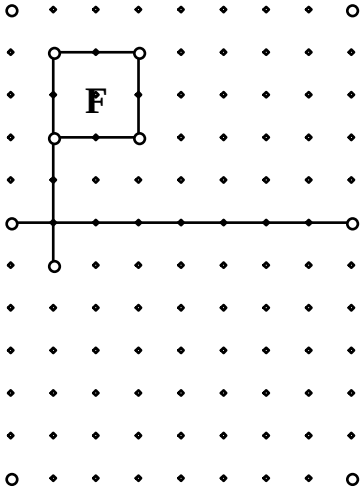


Reflections are described by their reflection lines or mirror lines:

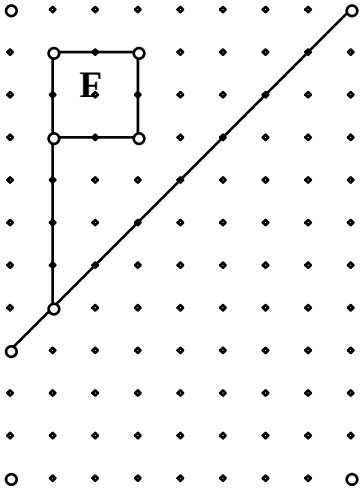
10. Show the result of reflecting in the line shown:



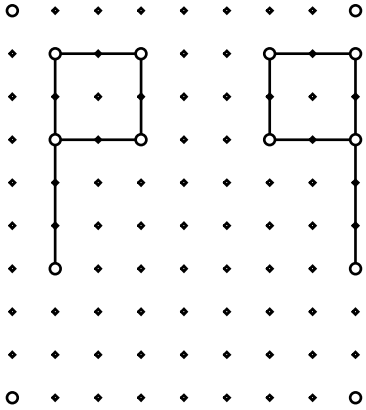
11. Show the result of reflecting in the line shown:



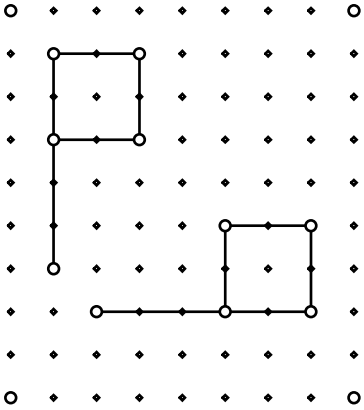
12. Show the result of reflecting in the line shown:



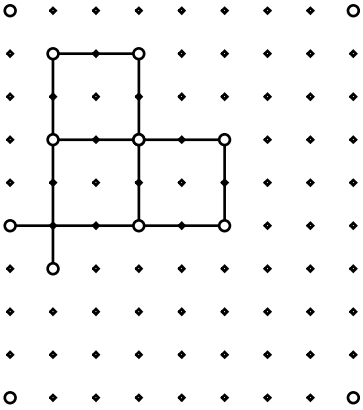
13. Draw the mirror line for the following reflection:



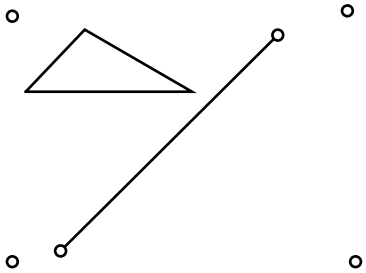
14. Draw the mirror line for the following reflection:



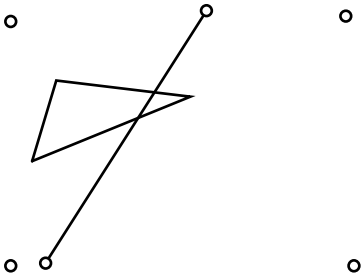
15. Draw the mirror line for the following reflection:



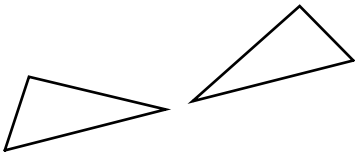
16. Draw the result of reflecting in the mirror shown:



17. Draw the result of reflecting in the mirror shown:

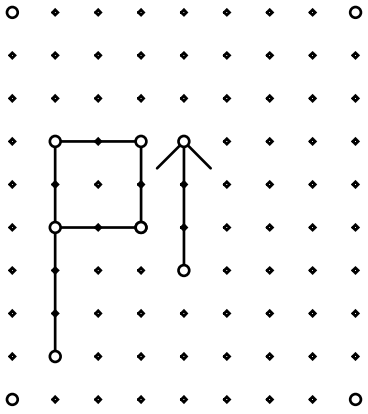


18. Sketch the mirror line for these triangles

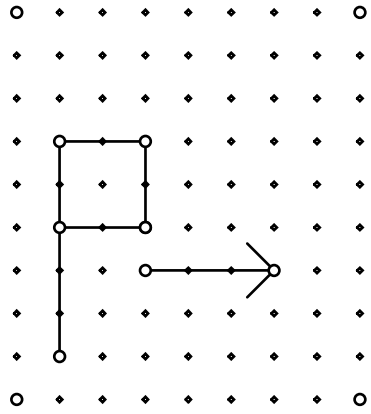


A glide reflection is a slide (translation) followed by a reflection. We will show a glide reflection as a translation arrow. Slide the figure as shown by the vector, then reflect in the line given by the arrow:

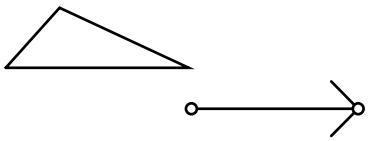
19. Show the result of the glide reflection drawn:



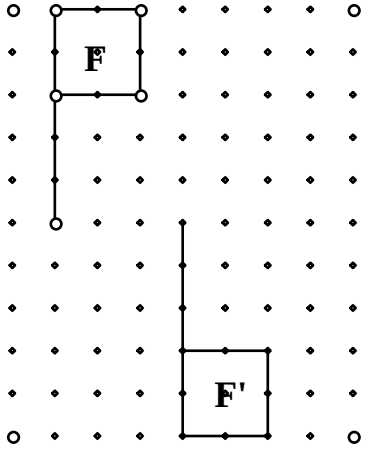
20. Show the result of the glide reflection drawn:



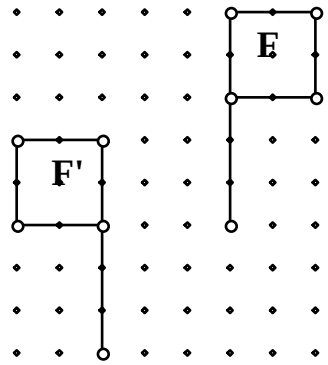
21. Show the result of the glide reflection drawn:



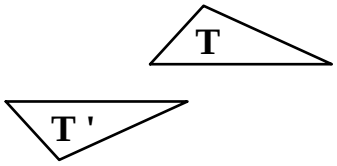
22. Draw a glide reflection arrow to show:



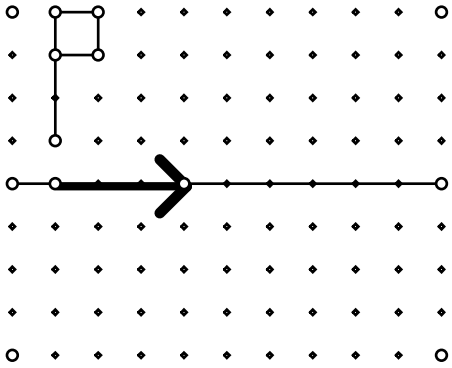
23. Draw a glide reflection arrow to show:



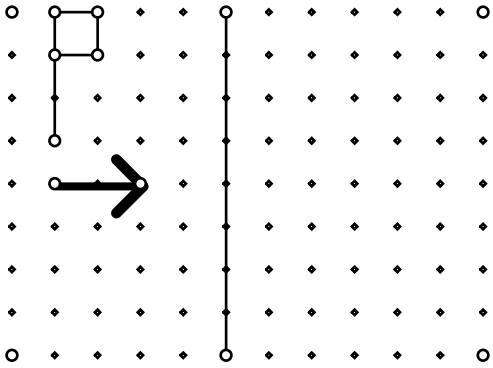
24. Draw a glide reflection arrow to show:



25. In one color, show the result of reflecting the flag in the line, and then sliding the reflection as indicated by the vector. And in another color, show the result of sliding and then reflecting.



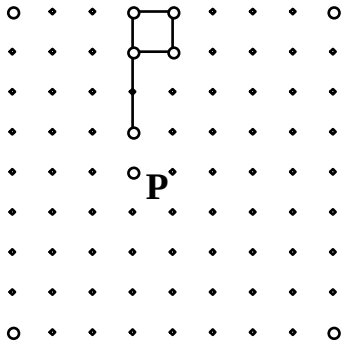
26. In one color, show the result of reflecting the flag in the line, and then sliding the reflection as indicated by the vector. In another color, show the result of sliding and then reflecting.



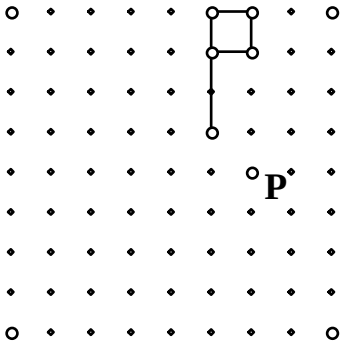
27. Why do we want the reflection line to be the same as the arrow line for glide reflections?

A rotation is given by a center point and an angle:

28. Show the flag rotated 90° clockwise around P

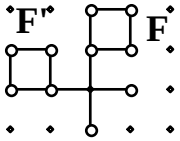


29. Show the flag rotated 90° counterclockwise around P

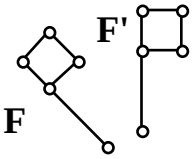


30. Show the flag rotated 120° counterclockwise around P

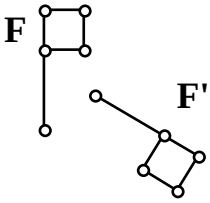
31. Identify the rotation point and angle for the following rotation:



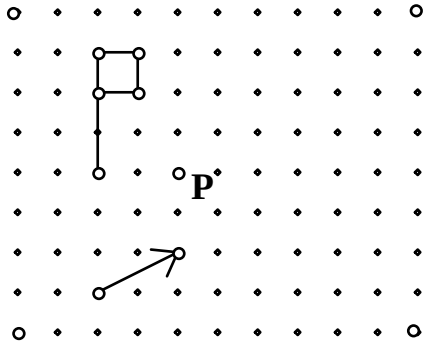
32. Estimate the rotation point and angle for the following rotation:



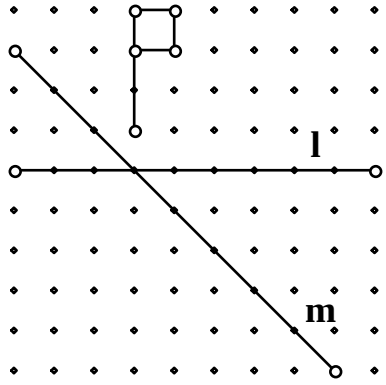
33. Estimate the rotation point and angle for the following rotation:



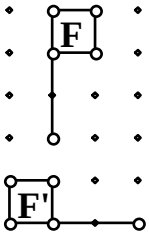
34. Translate the flag along the vector shown, then rotate the new flag 90° clockwise around the point P.



35. Reflect across line l, then reflect the new flag across line m.



36. Describe the transformation using 2-3 steps.



37. Describe the transformation using 2-3 steps.