Practice Exam

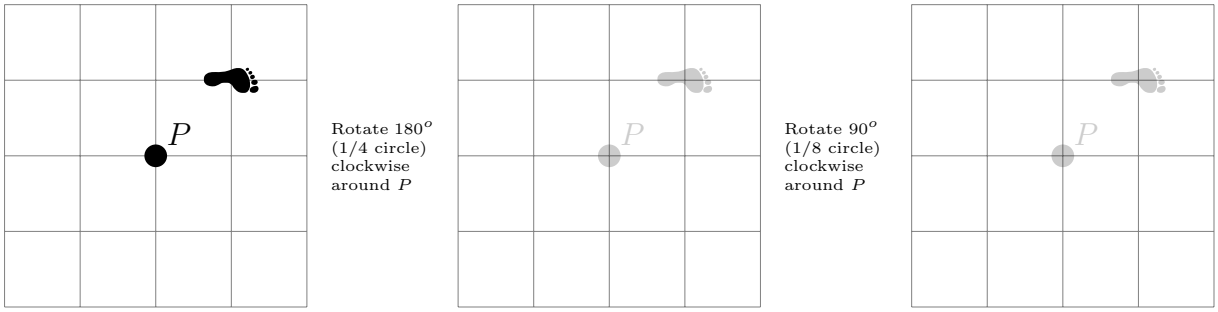
Name: _____

MA111-00[67]
2011-11-11

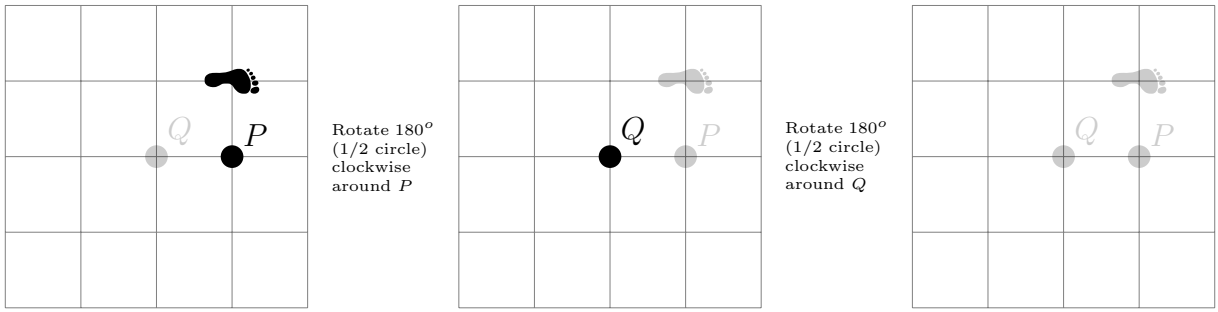
Part I: Applying Rigid Motions

Apply the indicated rigid motions to the figures. Each motion takes the grid directly on its left to the grid directly on its right. The gray ghosts on the second and later grids are just to help. You don't have apply the second rigid motions to them.

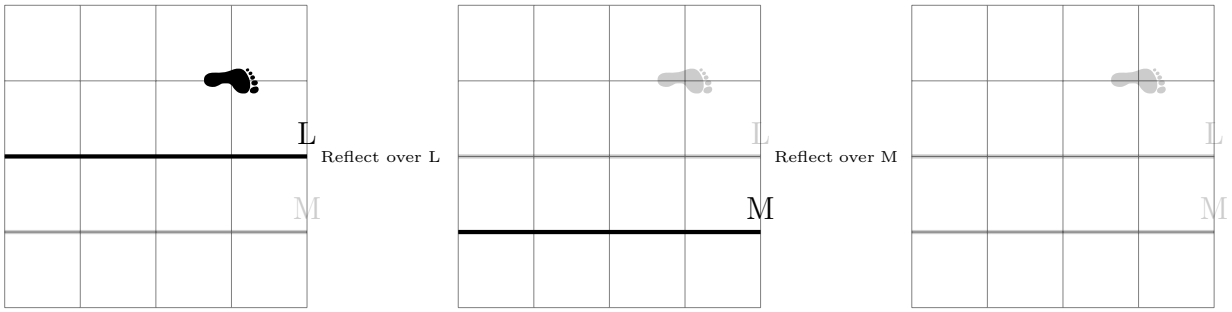
(a)



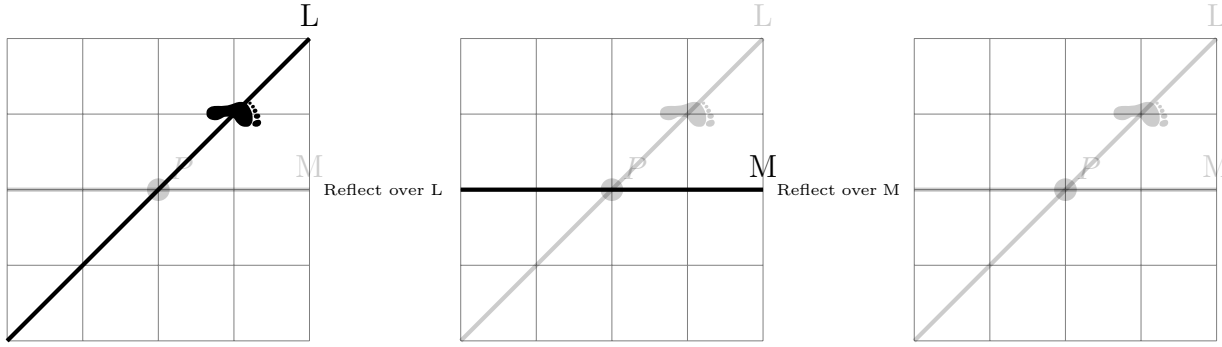
(b)



(c)



(d)



Part II: Composing Rigid Motions

Describe the resulting rigid motions from doing both operations. Be sure to give (1) the type, and (2) the parameters, such as direction, distance, rotocenter, and/or angle.

(a) Two rotations around "P", the first 180 degrees (1/2 circle), and the second 90 degrees (1/4 circle).

(b) Two rotations of 180 degrees whose rotocenters are 1 foot apart along a horizontal line, the second being one foot to the left of the first.

(c) Reflect over a horizontal line, then over a second horizontal line 1 foot below the first.

(d) Reflect over a 45^o diagonal line, then over a horizontal line crossing at "P"

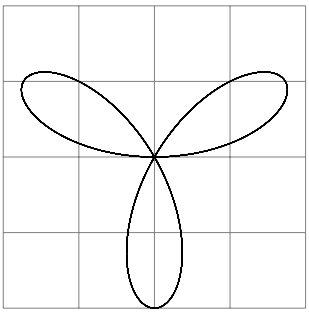
Answering the following questions about mirrors:

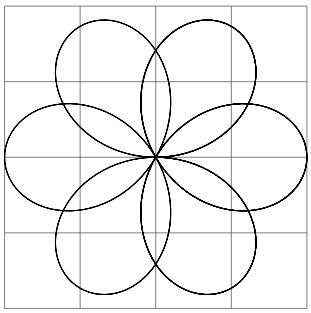
(e) Place two mirrors facing each other 1 foot across. Inside the mirror you'll see copies of yourself facing the same way as you (back turned). How far away from you does the first copy appear? _____feet

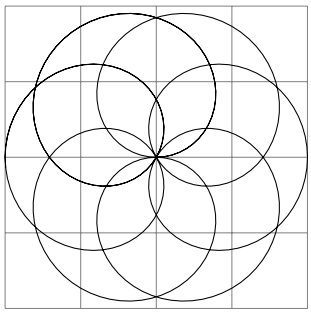
(f) Place two mirrors at a 45 degree angle (1/8th of the way around a circle). Inside the mirror you'll see copies of yourself facing different directions. Some of the copies of yourself will have their left hand on the left side. At what angle are these copies to you? _____degrees, or 1 / _____of a full circle.

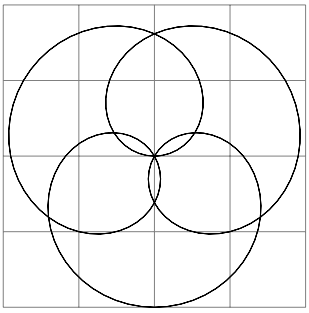
Part III: Identify Rosette Groups

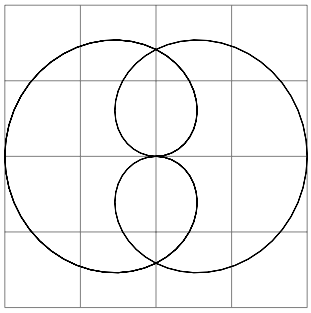
Identify the symmetry groups of the following "Rosettes":

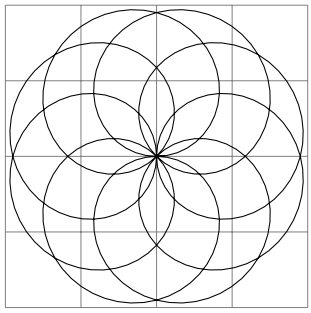


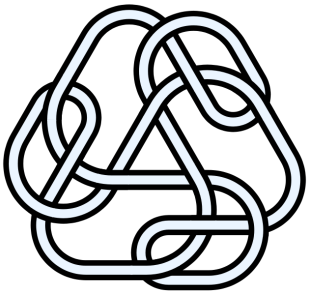


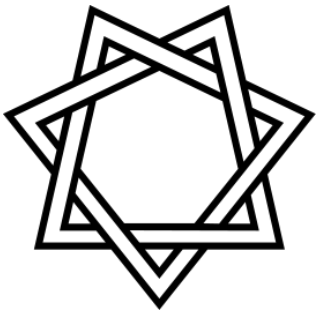


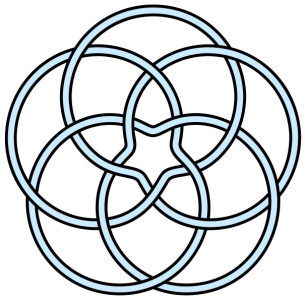












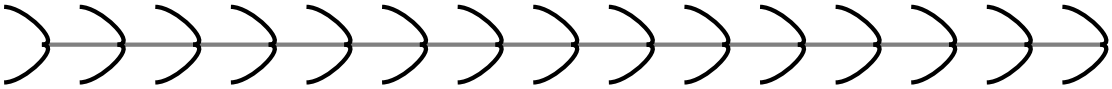
Part IV: Create Rosette Groups

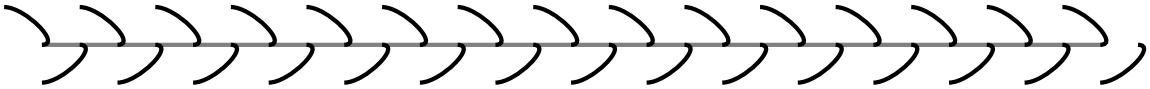
Draw (pretty) pictures with each of the following symmetry groups:

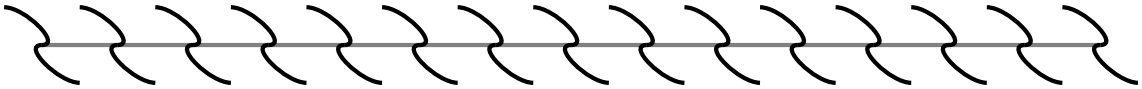
- Z1
- D1
- Z2
- D2
- Z3
- D3
- Z6
- D6

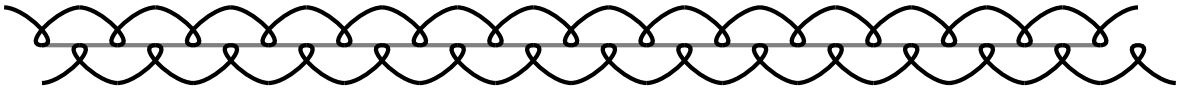
Part V: Identify Frieze Groups

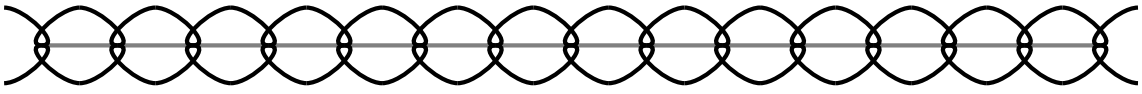
Identify the symmetry groups of the following "Friezes":











Part VI: Create Frieze Groups

Draw (pretty) pictures with each of the following symmetry groups:

- Hop
- Spin Hop
- Sidle
- Spin Sidle
- Jump
- Spin Jump
- Walk