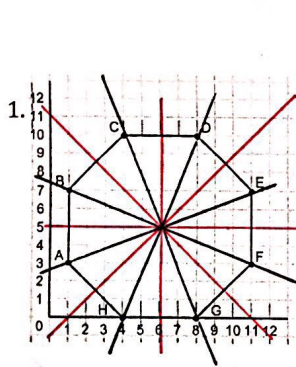
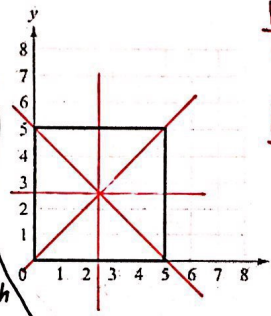


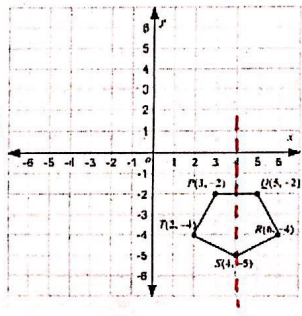
Describe any rotational or line symmetry for each figure in the coordinate plane.



around (6,5)  
Rotations:  $\uparrow$   
 $90^\circ, 180^\circ, 270^\circ$   
 (It is not quite regular)  
Reflections: (8 lines)  
 $Y=5$   $Y=x-1$   
 $X=6$   $Y=-x+11$   
 For the rest, point-slope form is easiest. All go through (6,5)



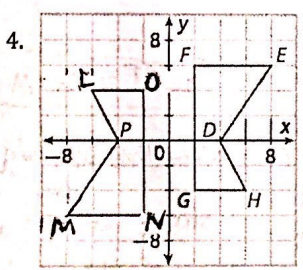
Rotations:  
 $90^\circ, 180^\circ, 270^\circ$   
 around (2.5, 2.5)  
Reflections: (4 lines)  
 $X=2.5$   
 $Y=2.5$   
 $Y=X$   
 $Y=-x+5$



No rotations  
 (It is not regular)  
Reflections: (1 line)  
 $X=4$

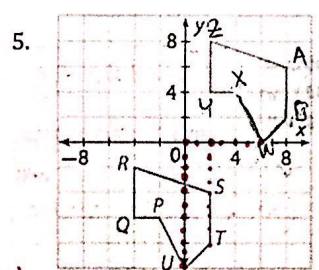
$\bullet Y-5 = \frac{2}{5}(x-6) \mid Y-5 = -\frac{2}{5}(x-6) \mid Y-5 = \frac{5}{2}(x-6) \mid Y-5 = -\frac{5}{2}(x-6) \mid$

1. Find a sequence of transformations that maps one figure to the other.
2. Write a congruency statement (i.e.  $\triangle ABC \cong \triangle DEF$ ). Order of the letters matters!
3. Identify congruent parts.



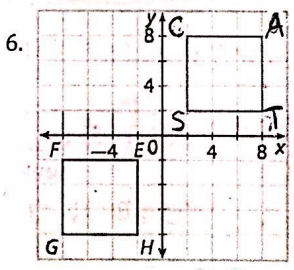
$180^\circ$  Rotation  
 OR  
 Reflect across x-axis,  
 then reflect across y-axis

$\triangle DEFGH \cong \triangle PMNLO$

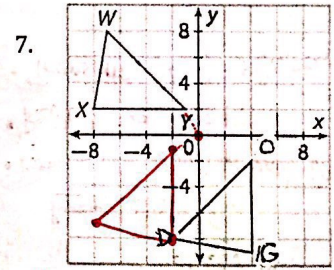


Translation:  
 $(x,y) \rightarrow (x-6, y-10)$

$\triangle ABWXYZ \cong \triangle STUPQR$



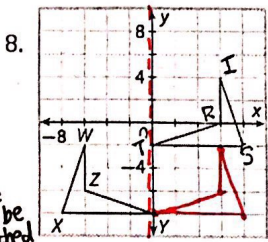
Translation:  $(x,y) \rightarrow (x-10, y-10)$   
 $\triangle CATS \cong \triangle FEHG$   
 OR  
 $180^\circ$  Rotation around (0,0)  
 $\triangle CATS \cong \triangle HGFE$   
 OR  
 Reflect across  $Y=-X$   
 $\triangle CATS \cong \triangle FGHE$



Rotation:  $90^\circ$  CCW around (0,0)  
 then Translation:  $(x,y) \rightarrow (x+6, y-1)$

$\triangle WXY \cong \triangle DGO$   
 $\angle W \cong \angle D$   $\overline{WX} \cong \overline{DG}$   
 $\angle X \cong \angle G$   $\overline{XY} \cong \overline{GO}$   
 $\angle Y \cong \angle O$   $\overline{WY} \cong \overline{DO}$  ← Congruent Parts

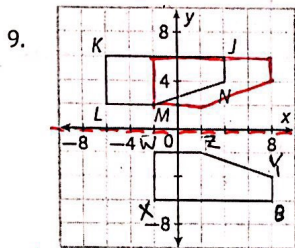
1. Find a sequence of transformations that maps one figure to the other.
2. Write a congruency statement (i.e.  $\triangle ABC \cong \triangle DEF$ ). Order of the letters matters!
3. Identify congruent parts.



These could be switched

Reflect across y-axis then  
Translate  $(x, y) \rightarrow (x, y + 6)$

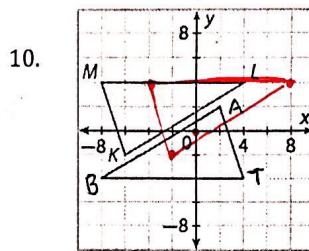
$WXYZ \cong ISTR$



Translate  $(x, y) \rightarrow (x + 4, y)$   
then  
Reflect across x-axis

$JKLMN \cong BXYZ$

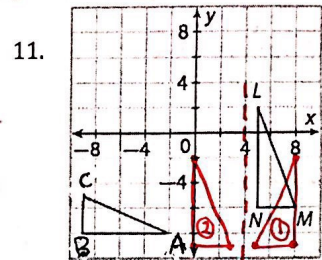
These could be switched



Rotate  $180^\circ$  around  $(0, 0)$   
then  
Translate  $(x, y) \rightarrow (x - 4, y)$   
OR  
Rotate  $180^\circ$  around  $(-2, 0)$

$\triangle BAT \cong \triangle LKM$

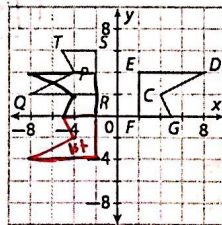
Challenge!



Possible Answer

- Rotate  $90^\circ$  CCW around  $(0, 0)$
- Reflect across  $x = 4$
- Translate  $(x, y) \rightarrow (x + 5, y + 3)$

12. **Draw Conclusions** Two students are trying to show that the two figures are congruent. The first student decides to map  $CDEFG$  to  $PQRST$  using a rotation of  $180^\circ$  around the origin, followed by the translation  $(x, y) \rightarrow (x, y + 6)$ . The second student believes the correct transformations are a reflection across the y-axis, followed by the vertical translation  $(x, y) \rightarrow (x, y - 2)$ . Are both students correct, is only one student correct, or is neither student correct?



Only the first student is correct.

13. Which sequence of transformations does not map a figure onto a congruent figure? Explain

- Rotation of  $180^\circ$  about the origin, reflection across the x-axis, horizontal translation  $(x, y) \rightarrow (x + 4, y)$
- Reflection across the y-axis, combined translation  $(x, y) \rightarrow (x - 5, y + 2)$
- Rotation of  $180^\circ$  about the origin, reflection across the y-axis, dilation  $(x, y) \rightarrow (2x, 2y)$
- Counterclockwise rotation of  $90^\circ$  about the origin, reflection across the y-axis, combined translation  $(x, y) \rightarrow (x - 11, y - 12)$

\* The image will not be congruent because the dilation will make it bigger.