Transformations III - Reflections

1) Draw X and Y axes and label from -8 to 8 on each axis. Plot the shape S with vertices at (4,2), (7,3), (7,4), and (5,6).

(a) Draw and label the shapes:
P: the image of S after a reflection in the line x=2
Q: the image of P after a reflection in the line y=-1

(b) What single transformation would take S onto Q ?

2) Draw X and Y axes and label the X axis from -6 to 21 and the Y axis from -6 to 6. Plot the shape S with vertices at (4,2), (7,2), (7,3) and (5,5).

(a) Draw and label the shapes:
F: the image of S after a reflection in the line x=1
G: the image of F after a reflection in the line x=8
(b) What transformation would take S onto G ?

3) Draw X and Y axes and label from -6 to 15 on the X axis and from -10 to 6 on the Y-axis. Plot the shape S with vertices at (1,1), (3,1), (3,3), and (1,4).

(a) Draw and label the shapes:
F: the image of S after a reflection in the line x=5
G: the image of F after a reflection in the line y=-x
(b) What transformation would take S onto G ?

(c) Draw and label the shapes:
P: the image of S after a reflection in the line y=-x
Q: the image of P after a reflection in the line x=5
(d) What transformation would take S onto Q?
(e) What transformation would take P onto G ?

4) (a) Look back at your answer to question 1(b). Can you make a rule about the combined effect of a reflection in ANY vertical line x=a, followed by .reflection in any horizontal line y=b? Test your rule out on an example of your own.
(b) Now look at your answer to question 2. Can you make a rule about the combined effect of reflection in two vertical lines, ie reflection in x=a followed by reflection in x=b? You may need to try one or two examples of your own to get a rule that always works.

5) Draw X and Y axes and label the X axis from -8 to 15 and the Y axis from -2 to 8. Plot the triangle T with vertices at (-3,1), (-1,2) and (-3,6).
(a) Draw and label the shapes:
P: the image of T after reflection in the line x=3
Q: the image of P after the translation $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$
(b) What transformation would take T onto Q ?

(c) Draw and label the shapes:
F: the image of T after the translation $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$
G: the image of F after reflection in the line x=3
(d) What transformation would take T onto G ?
(e) What transformation would take Q onto G ?