

# Geometry – Multiple Transformations

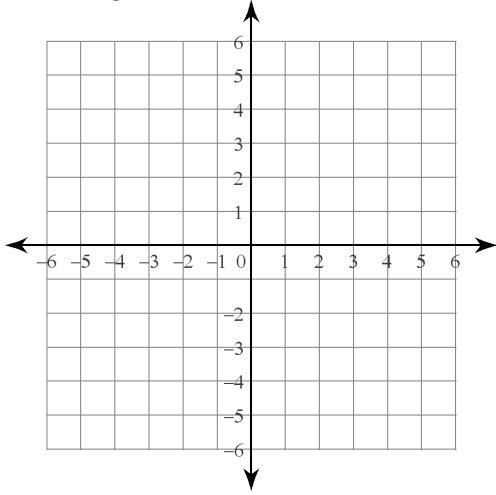
Name: \_\_\_\_\_

You should already know how to do the following:

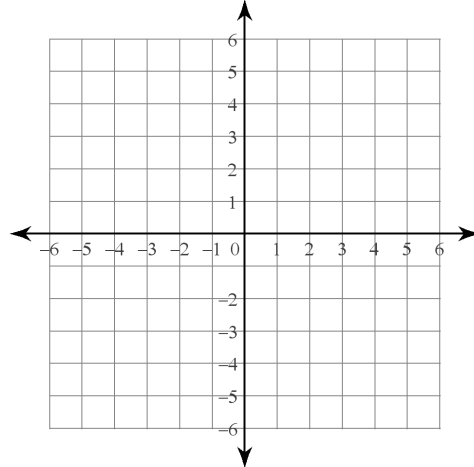
- Translations (slides)
- Reflections (flips, like with a mirror)
- Rotations (spins or turns)
- Dilations (stretches or shrinks)

Let's review to get "warmed-up".

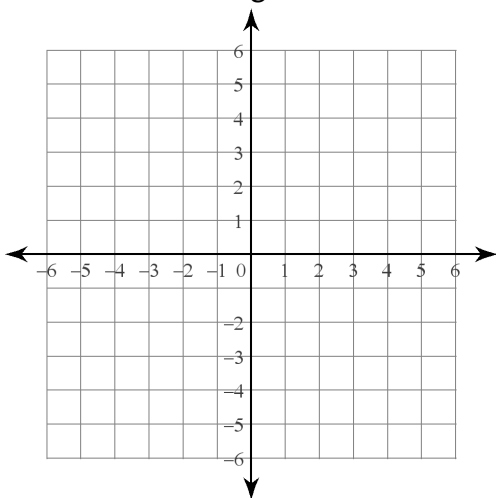
1) Translate  $\triangle QRS$  if  $Q(4,1)$ ,  $R(1,-2)$ ,  $S(2,3)$  by moving it left 3 and down 4.



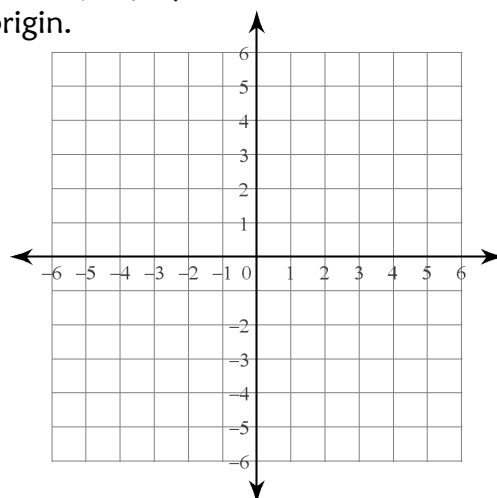
2) Reflect  $\triangle Q'R'S'$  if  $Q'(1,-3)$ ,  $R'(-2,-6)$ , and  $S'(-1,-1)$  over the x-axis.



3) Rotate  $\triangle CAR$  if  $C(-1,-4)$ ,  $A(2,6)$ ,  $R(-4,-2)$   $180^\circ$  around the origin.



4) Dilate  $\triangle C'A'R'$  if  $C'(2,4)$ ,  $A'(-2,-6)$ , and  $R'(4,2)$  by a scale factor of  $\frac{1}{2}$  from the origin.

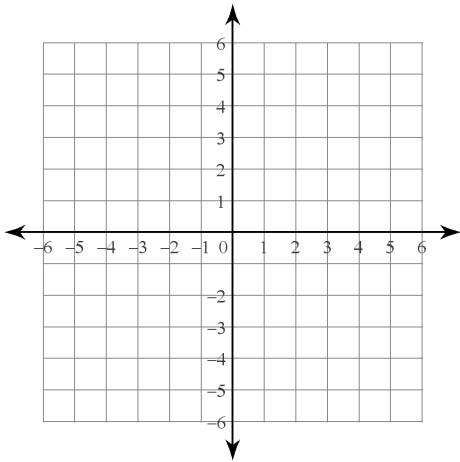


5) What did you notice in problems 1&2 and problems 3&4? How were the shapes related? Explain how you could transform  $\triangle QRS$  by translating it left 3 and down 4 and then reflecting the image over the x-axis. Where does the final image end up?

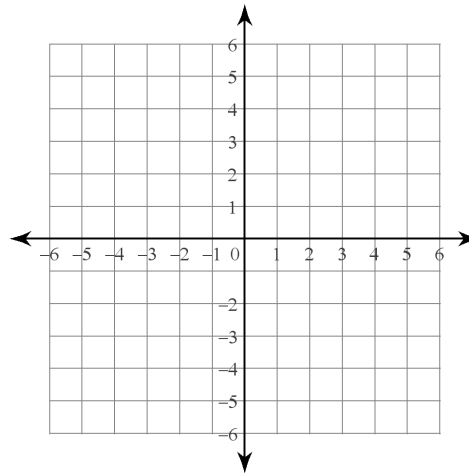
6) How would you rotate  $\triangle CAR$   $180^\circ$  about the origin and then dilate it by a scale factor of  $\frac{1}{2}$ ?

7. Now you are going to try some multiple transformations:

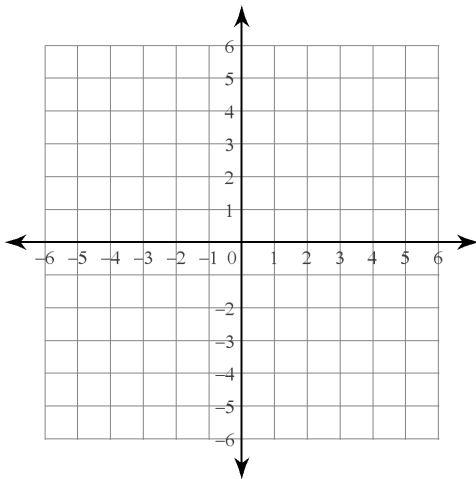
a) Translate  $\triangle ALT$  if  $A(-5,-1)$ ,  $L(-3,-2)$ ,  $T(-3,2)$  by moving it right 6 and down 3, then reflect the image over the  $y$ -axis.



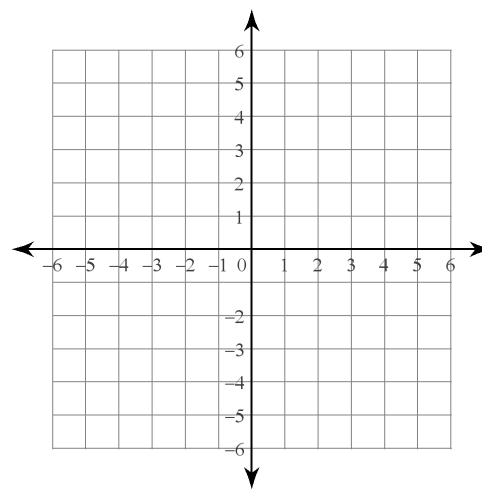
b) Reflect  $\triangle TAB$  if  $T(2,3)$ ,  $A(1,1)$ , and  $B(4,-3)$  over the  $x$ -axis, then reflect the image over the  $y$ -axis.



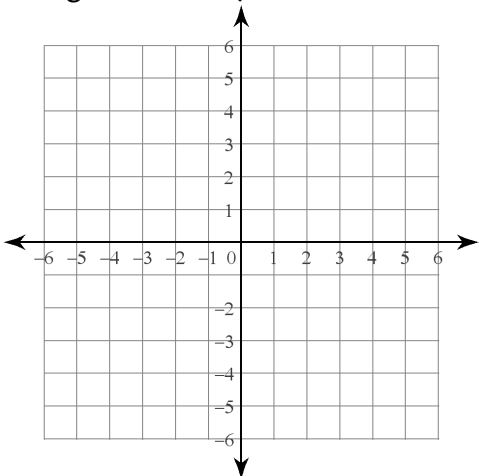
c) Rotate  $\triangle ALT$  if  $A(-5,-1)$ ,  $L(-3,-2)$ ,  $T(-3,2)$   $90^\circ$  clockwise around the origin, then reflect the image over the  $x$ -axis.



d) Reflect  $\triangle TAB$  if  $T(2,3)$ ,  $A(1,1)$ , and  $B(4,-3)$  over the  $y$ -axis, then translate the image by moving it right 2 and down 1.



e) Rotate  $\triangle ALT$  if  $A(-5,-1)$ ,  $L(-3,-2)$ ,  $T(-3,2)$   $180^\circ$  clockwise around the origin, then reflect the image over the  $y$ -axis.



f) Reflect  $\triangle TAB$  if  $T(2,3)$ ,  $A(1,1)$ , and  $B(4,-3)$  over the  $x$ -axis, then translate the image by moving it left 5 and down 4.

